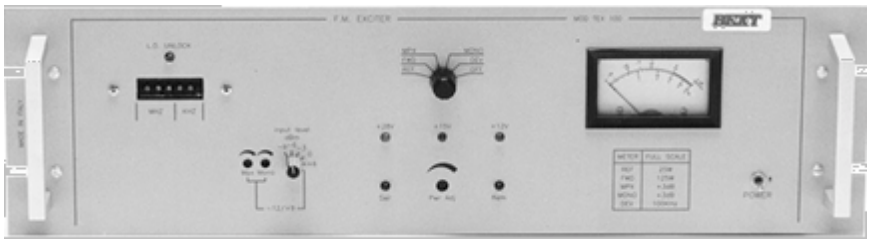
XT300



Technical Manual

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XT300 and XT300/S
300W Mono and Stereo Synthesized Exciter 87.5-108 MHz
Technical and Maintenance Manual

INDEX

PRELIMINARY INSTRUCTIONS AND WARRANTY INFORMATION

WARNING: This is “class A” equipment. In a residential place this can cause R.F. Burns. In this situation the user is recommended to take appropriate action.

Please observe safety precautions when handling this unit. This equipment contains dangerous voltages and currents.

This manual is written as a general guide for those having previous knowledge and experience with this kind of equipment. It is not intended to contain a complete statement of all safety precautions which should be observe by people working on this or other electronic equipment.

Bext, Inc. doesn’t assume responsibility for injury or damage resulting from improper procedures or practices by untrained/unqualified personnel in the handling of this unit.

Please observe all local codes and fire protection standards in the operation of this unit.

CAUTION: Always disconnect power before opening covers or removing any part of this unit. Use appropriate grounding procedures to short out capacitors and high voltage points before servicing.

Any damage to the goods must be reported to the carrier in writing on the shipment receipt. Any discrepancy or damage discovered subsequent to delivery, must be reported to Bext, Inc. within five (5) days of receipt.

Bext, Inc. extends to the original end-user purchaser all original manufacturers’ warranties which are transferable and all claims are to be made directly to Bext, Inc. per indicated procedures.

All manufacturers’ warranties will be supported by Bext, Inc. to ensure precise and speedy service where possible.

Bext, Inc. shall not be liable for any damage of whatsoever nature, arising out of or in connection with the product or its use.

Bext, Inc. warranty shall not include:

1) Reshipments of unit to Bext, Inc. for repair purposes
2) Any unauthorized repair/modification
3) Incidental/consequential damages as a result of any defect
4) Nominal non-incidental defects
5) Reshipment costs or insurance of the unit or replacement unit/parts

Warranty shall come into force from invoice date and for the period of manufactures’ warranty.

The warranty is good for a period of 24 months on any Bext, Inc. product, while for products such as transistors, Mos-FET and tubes of the final stages, the warranty is based on the product's manufaturer's warranty.

To claim your rights under this warranty:

a. Contact the dealer or distributor where you purchased the unit. Describe the problem and ask if he has an easy solution. Dealer and distributors are supplied with all the information about problems that may occur and usually they can repair the unit quicker than what the manufacturer could do. Very often installation errors are discovered by dealers.

b. If your dealer cannot help you, contact Bext, Inc. and explain the problem. If it is decided to the return the unit to the factory, Bext, Inc. will give you a return authorization and all the necessary instructions to send back the goods.

c. When you receive the authorization, you can return the unit. Pack it carefully for shipment, preferably using the original packing, and seal the package perfectly. The customer always assumes the risks of loss (i.e., Bext, Inc. is never responsible for damage or loss), until the package reaches Bext, Inc. premises. For this reason, we suggest that you insure the goods for the whole value.

Replacement and warranty parts may be ordered from the following address. Be sure to include the equipment model and serial numbers well as part description and part number.

Bext, Inc.
1045 Tenth Avenue
San Diego, CA 92101
(619) 239-8462
(619) 239-8474 Fax
support@bext.com

Bext, Inc. reserves the right to modify the design and specifications of the equipment in this manual without previous notice.

Warning!

The voltages and currents in this equipment are dangerous! Personnel must at all times observe safety precautions.

Warning!

Always disconnect power before opening covers, doors, enclosures, gates, panels or shields. Always use grounding sticks and short out high voltage points before servicing. Never make internal adjustments, perform maintenance or service when alone or when fatigued.

Do not remove, short-circuit or tamper with interlock switches on access covers, doors, enclosures, gates, panels or shields. Keep away from live circuits, know your equipment and don’t take chances.

Warning!

In case of emergency ensure that the power has been disconnected.

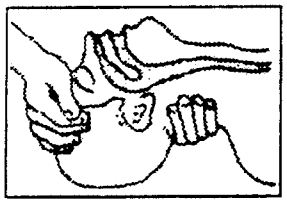
Treatment of Electrical Shock

1) If victim is not responsive follow the A-B-C's of basic life support.

PLACE VICTIM FLAT ON HIS BACK ON A HARD SURFACE

A AIRWAY

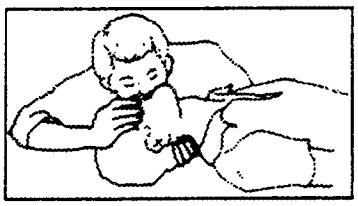
IF UNCONSCIOUS,
OPEN AIRWAY



LIFT UP NECK,
PUSH FOREHEAD BACK,
CLEAR OUT MOUTH IF NECESSARY,
OBSERVE FOR BREATHING.

B BREATHING

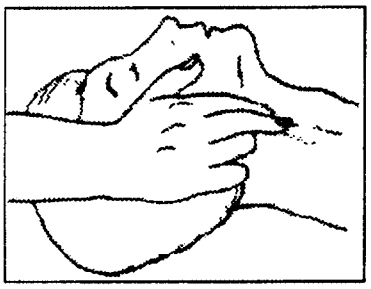
IF NOT BREATHING,
BEGIN ARTIFICIAL
BREATHING



TILT HEAD,
PINCH NOSTRILS,
MAKE AIRTIGHT SEAL,
4 QUICK FULL BREATHS.
REMEMBER MOUTH TO MOUTH
RESUSCITATION MUST BE
COMMENCED AS SOON AS
POSSIBLE.

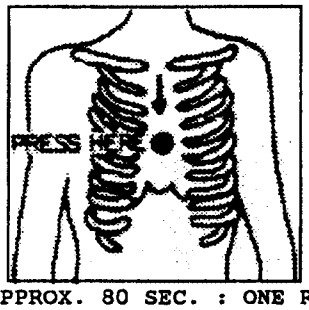
C CIRCULATION

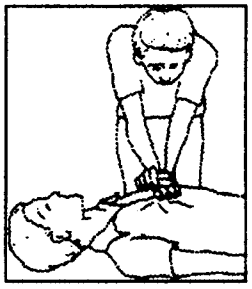
CHECK CAROTID PULSE



IF PULSE ABSENT,
BEGIN ARTIFICIAL
CIRCULATION

DEPRESS STERNUM 1 1/2" TO 2"





APPROX. 80 SEC. : ONE RESCUER, 15 COMPRESSIONS,
2 QUICK BREATHS.

APPROX. 60 SEC. : TWO RESCUERS, 5 COMPRESSIONS,
1 BREATH

NOTE: DO NOT INTERRUPT RHYTHM OF COMPRESSIONS WHEN SECOND PERSON IS GIVING BREATH.

Call for medical assistance as soon as possible.

2) If victim is responsive.
   a. Keep them warm.
   b. Keep them as quiet as possible.
   c. Loosen their clothing (a reclining position is recommended).

FIRST-AID

Personnel engaged in the installation, operation, maintenance or servicing of this equipment are urged to become familiar with first-aid theory and practices. The following information is not intended to be a complete first-aid procedure, it is brief and is only to be used as a reference. It is the duty of all personnel using the equipment to be prepared to give adequate Emergency First Aid and thereby prevent avoidable loss of life.

Treatment of electrical Burns

1) Extensive burned and broken skin.

   a. Cover area with clean sheet or cloth. (Cleanest available cloth article).
   b. Do not break blisters, remove tissue, remove adhered particles of clothing, or apply any salve or ointment.
   c. Treat victim for shock as required.
   d. Arrange transportation to a hospital as quickly as possible
   e. If arms or legs are affected keep them elevated.

NOTE

If medical help will not be available within an hour and the victim is conscious and not vomiting, give him a weak solution of salt and soda: 1 level teaspoonful of salt and 1/2 level teaspoonful of baking soda to each quart of water (neither hot or cold).
Allow victim to sip slowly about 4 ounces (half a glass) over a period of 15 minutes.
Discontinue fluid if vomiting occurs (Do not give alcohol).

2) Less severe burns - (1st & 2nd degree)

   a. Apply cool (not ice cold) compresses using the cleanest available cloth article.
   b. Do not break blisters, remove tissue, remove adhered particles of clothing, or apply salve or ointment.
   c. Apply clean dry dressing if necessary.
   d. Treat victim for shock as required.
   e. Arrange transportation to a hospital as quickly as possible.
   f. If arms or legs are affected keep them elevated.

Chapter 1

DESCRIPTION OF THE XT300 and XT300/S

1.0 INTRODUCTION

This manual contains technical information about the XT300 and XT300/S exciters. For more simplicity we will always refer to the XT300, unless specified for clarity.

1.1 GENERAL DESCRIPTION

The XT300 is housed in a 3U, 19" rack-mounting container comprising a number of interconnected modules mounted internally on the main chassis, facilitating removal and substitution. The power output control, audio input level control and analog meter for measurement of the operating parameters, are all mounted on the front panel. The AC line power, audio input, RF output and telemetry connectors are mounted on the rear panel.

1.2 ELECTRICAL DESCRIPTION

The XT300 is an exciter working in the 87.5 to 108 MHz band, programmable in steps of 10 KHz. Its power output is continuously adjustable from 10W to 300W into a 50 Ohm load. The XT300 incorperates a stereo coder card which guarentees excellent stereo separation together with low harmonic distortion (only for Stereo Version). It also accepts two SCA Signals.

A front panel switch allows stereo operation (only for Stereo Version) or "mono/mpx" operation which excludes the stereo encoder and uses the "right" input as the mono input and the "left" input as the wideband composite input.

The specifications feature low audio distortion and intermodulation figures (typically 0.03%) and a high signal-to-noise ratio (typically -80dB).

1.3 METERS AND INDICATORS

The operating parameters of the exciter can be monitored using the analog multimeter situated on the front panel. The parameter to be measured is selected by the rotary selector switch.

The frequency control allows frequencies to be selected in steps of 10 KHz. Three red alarm LEDs indicate VCO unlock, excess VSWR on the output and excessive temerature, and the shutdown condition, programed by a remote command.

Three green LEDs indicate the presence of +12V, +15V and +28V voltages which are used to power the various cards inside the exciter. A selector switch allows selection between Mono/Mpx and Stereo functions and another selector switch provides a choice of level input signal. Trimmers are provided for adjustment of left and right channels and a switch allows the stereo subcarrier to be enabled or disabled.

1.4 AUTOMATIC FREQUENCY CONTROL

The operating frequency is governed by a thermally-compensated, reference oscillator working within a phase locked loop (PLL). The XT300 reaches frequency lock within a maximum of 30 seconds.

1.5 CONTROL CIRCUITS

The control circuits allow automatic control of the output power (internal and external), maintaining the chosen power level across the entire operating band. Furthermore, another circuit protects the final stage against excessive VSWR or short circuits and excessive temperature. Then, there are other protection circuits that act to limit the maximum output power and to protect the equipment against a power supply's overvoltage.

1.6 R.F. POWER AMPLIFIER

The RF amplifier is a broadband design and guarantees an adjustable power output of 10 to 300 Watts across the entire band. A low pass filter enables the XT300 to be used as a low power transmitter, connected directly to an antenna.

1.7 SPECIFICATIONS

Please refer to Table (A) for the electrical specifications and Table (B) for mechanical specifications.

TABLE A

ELECTRICAL SPECIFICATIONS

Power supply	117-230V +/- 10 %, 50-60 Hz single phase
Power Consumption	approx. 600 W
Cooling	Forced ventilation
Frequencies	87.5 to 108 MHz in steps of 10 KHz
Output power	adjustable from 10 to 30 W
Automatic Output Level Control	Stabilizes the set RF output level
Output Impedance	50 Ohm
Output Connector	Standard N-type
Harmonic Suppression	> -65 dB
Spurious Signal Suppression	> -80 dB
Mono Intermodulation Distortion	0.05 % or less, measured at 1 KHz and 1.3 KHz, ratio 1:1 at 100 % modulation
Frequency Stability	+/- 500 Hz (typically +/- 300 Hz) from 0 deg to 50 deg C
Modulation Type	Direct frequency modulation of the RF oscillator at the fundamental frequency
Frequency Deviation	+/- 75 KHz nominal
Harmonic Distortion	< 0.05 % (typically 0.01 %)
FM Signal-to-Noise Ratio	> 75 dB mono, > 70 dB stereo measured with 75 KHz deviation in the 30 Hz to 15 KHz band RMS.
Residual AM (asynchronous)	Approx. 0.05 % + 65 dB RMS

Residual AM (Synchronous)	0.1% = 60dB
Pre-emphasis	50uS +/- 2% 0r 75 uS +/- 2% selectable
Audio Input Impeadance	10 KOhm balanced or 5K Ohm unbalanced (600 Ohm on request)
Audio Input Level	Selectable from -9 to +6 dBm in five steps Continuous from -12 to +9 dBm
Audio Frequency Range	30-15000 Hz, MONO input 30-100000 Hz, MPX input
Audio Input Filter	> 45 dB at 19 KHz (Mono) > 40 dB from 20 KHz to 100 KHz
Mono Frequency Response	+/-0.3 dB from 30 Hz to 15KHz
MPX Frequency Response	+/-0.5 dB from 30 Hz to 75KHz
Stereo Separation	> 45 dB (typically 50 dB)
Pilot Tone Frequency	19 KHz +/- 1 Hz
Pilot Tone Level	-20 dBm adjustable
Number of SCA inputs	2
SCA Input Impedance	1 KOhm unbalanced
SCA Input Level	0 dBm for +/- 7.5 KHz of deviation
SCA Input Response	+/- 0.5 dBm from 40 KHz to 100 KHz

TABLE B

MECHANICAL SPECIFICATIONS

Rack dimensions	483.0 mm (19.0”) W 132.5 mm (5.20”) H 500.0 mm (19.7”) D
Operating temperature	from -10 deg C to 45 deg C
Humidity	95 % max. non-condensing
Weight	22 Kg

Chapter 2

ELECTRICAL DESCRIPTION

2.1 INTRODUCTION

This section describes, in detail, the operating theory behind the XT300. To aid understanding, the unit has been subdivided into blocks, each of which is fully described below. The block diagram is shown in Fig. 3

2.2 POWER SUPPLY

This circuit comprises a board, mounted on a heat sink, which is fixed to the central part of the lower section of the unit. The power supply generates the various modules that make up the XT300. The transformer has a selectable input from 110V to 240V and three outputs:
A. 30/0/30V (9A), B. 36V (0.5A), and C. 20V (1A).

This power supply is composed of two main parts: after having undergone filtering for mains-borne interference, the supply is transformed into four lower voltages, rectified, smoothed and stablized to the following values: +12V, +15V +15 variable and +50V to obtain the higher efficiency switching power supply (85-90%).

The +15V supplies the encoder mixer, the PLL card, the VCO card, the meter card and the alarms card. The +12V supplies the fan . The +15V variable supplies the input of the RF power module amplifier driver (BLF244) and the 50V supplies the final power stage (BLF278).

The variable voltage of the final stage driver is controlled by the PWR ADJ control which determines the RF power output of the exciter. The automatic control of the output power guarantees the power level set by the PWR ADJ control right across the frequency range and independently of the other variables such as temperature, load variations etc.

The system works by comparing the value set by the PWR ADJ control with the actual power output of the unit and compensating accordingly.

2.3 AUDIO INPUT CARD

This card is situated on the rear panel of the exciter. The card filters all audio signal inputs to the unit, removing RF interference, before supplying them to the encoder mixer or mono/mpx card. The main operating parameters of the exciter are available for remote monitoring via the telemetry connector.

2.4 STEREO CODER CARD (only for Stereo Version)

This card is situated in the lower part of the unit.

The card can function either as a stereo encoder or as a simple mixer for the various audio inputs. The function may be selected by a control situated on the front panel. In the stereo encoder mode, the 19 KHz pilot tone is derived from a quartz crystal reference oscillator. So too is the sampling frequency which allows the L and R signals to be separated from the multiplexing signal. Plus the suppresion of the 38 KHz frequency. The level of the left and right signals are set by the corresponding selector situated on the front panel. The signals are filtered at 15 KHz and pre-emphasized (50 uS CCIR, 75 uS FCC) before being sent to the multiplexing circuit. The audio signals from the two SCA inputs are mixed in to provide the output. In the mixer mode (Mono/Mpx) the stereo encoder is bypassed, the right input accepts a mono signal and the left input accepts a multiplex signal up to 100 KHz. The SCA inputs remain unchanged. Three rectifiers allow the peak levels of the two inputs “Left/MPX” and “RIGHT/MONO” to be displayed on the analog meter, and provide the audio detector circuit with the deviation level.

2.5 PLL CARD

The PLL card is situated internally, in the upper part of the unit. The circuit includes a reference crystal oscillator (optional high stability), a logic section that includes the frequency dividers and comparator. The reference crystal oscillator generates a 4 MHz frequency that is divided to generate a fixed 1 KHz signal. This signal is compared to the operating frequency generated by the VCO divided based on the frequency set on the contraves board. An indicator situated on the front panel signals the “unlocked” condition. The comparator output (AFC signal) is sent to the varicap diodes situated on the VCO card.

2.6 VCO CARD

The VCO card is situated internally, in the upper part of the unit. This module includes an audio input stage at low frequency, a voltage controlled oscillator (VCO) and driver stage. The audio signal supplied by the encoder mixer is amplified and then injected into the VCO to provide class F3 modulation. The voltage controlled oscillator (VCO) generates the signal on the frequency set on the contraves. This signal is amplified to 300mW level (25dBm) to drive the final stage and sent to the PLL circuit situated on the PLL card. The operating frequency generated by the VCO is divided down before being compared to a reference frequency, generated by a high stability oscillator (standard 5 ppm).

The error voltage is filtered and used to compensate the VCO frequency and guarantee its stability. A trimmer is present on this card for adjustment of deviation.

2.7 RF POWER AMPLIFIER

The final power stage is mounted on a heat sink to dissipate waste heat and is enclosed in a totally screened metal container, fixed to the upper-middle part of the central section of the unit. The RF signal coming from the stereo decoder or Mono/MPX at a power level of about 300mW, reaches the driver stage (BLF244) and is amplified to a level from about 300mW to 8W before being further amplified by the final stage (BLF278) to a level of up to 300W. The resultant signal is then filtered by a low-pass filter which removes any harmonic content. A directional coupler allows the direct and reflected power levels to be measured and displayed on the analog multimeter and fedback to the power supply for automatic control of the output power (see power supply description). A BNC connector situated on the rear panel provides a power signal at -60db of the amplifier output power.

2.8 METER CARD

This card is situated centrally on the front panel. The card receives direct and reflected power signals from the power supply which, in turn, come from the final power stage. The stereo encoder card supplies deviation and left and right signal levels. These signal levels are then displayed on the analog meter according to the position of the rotary selector situated on the front panel.

2.9 FREQUENCY SELECTOR CARD

This card is located on the left-hand side of the front panel. The operating frequency selected by the frequency control is represented by a signal which is supplied to the frequency dividers that form part of the PLL circuits found on the PLL card.

2.10 ALARMS CARD

This card is fixed in the lower part of the unit. This circuit allows 7 adjustments via trimmers, the threshold of the external and internal output level, internal and external VSWR level, temperature and to preset the maximum value of the output power. In case of a fault there is no automatic reset, because the transmitter automatically reduces the output power to continue transmitting without interruption, even if at minimum power.

2.11 SOFT START

The soft start is mounted on a board placed on the front side of the transmitter. The circuit eliminates the current spikes generated by the transformer when it is powered.

2.12 MONO/MPX CODER CARD (Mono Version)

This card is located in the lower part of the unit. The Mono/MPX card is an Audio Mixer at four inputs: two balanced (Mono and MPX) and two unbalanced (SCA1 and SCA2). Mono and MPX input level can be set through decade thumbwheel switches on the front panel, on 5 fixed positions and on a variable position from -12 dBm to +9 dBm (preset at 0 dBm). It's possible to set the pre-emphasis value at 50uS, 75uS or linear. Then, it's possible to insert or remove a low pass filter at 15KHz.

2.13 CLIPPER CARD

This card is attached with a sandwich structure on the coder card and is accessible from the lower part of the equipment. Its function is to limit drastically any audio signal that exceeds a prefixed threshold. Therefore, it's used to avoid any type of overmodulation which exceeds maximum peak permitted of +/- 75 KHz.

FRONT PANEL STEREO VERSION VEIW DESCRIPTION (FIG. 1A)

1	STEREO/MONO-MPX	Selects STEREO or MONO/MPX operation
2	STEREO LED	Indicates the operation of the stereo encoder
3	19KHz LED	Indicates the 19KHz pilot tone presence
4	MODE SELECTOR	Button in: STEREO OPERATION MODE PILOT TONE PRESENT Button out: MONO OPERATION MODE PILOT TONE ABSENT
5	L/MPX &R/MONO LEVEL	L/MPX AND R/MONO input level adjustable from -12 to +9 dBm; this is possible if the input level switch is completely turned clock wise
6	INPUT LEVEL	Input signal attenuator adjustable in 5 steps from -9 to +6 dBm
7	VOLTAGE LEDs	Indicates the presence of the internal operating voltages +12V, +15V and +28V
8	SWR	Indicates that reflected power exceeds 30W
9	PWR ADJ	10-turn trimmer to regulate the power output of the exciter. AGC maintains the level set by this control
10	REM	Indicates that the exciter has been shut-down by remote control
11	MEASUREMENT SELECTOR	The measurement made by the meter corresponds to the position of this selector
12	METER	Analog meter used to display the following operating parameters of the exciter: Direct power f.s. 375W Reflected power f.s. 37.5W Deviation f.s. 100KHz Right channel input level f.s. +3dB Left channel input level f.s. +3dB
13	POWER	ON/OFF switch
14	MHz/KHz	Rotary frequency selector
15	L.O. UNLOCK	If ON indicates that the VCO is not locked to the reference frequency. The output power will drop to zero in this condition

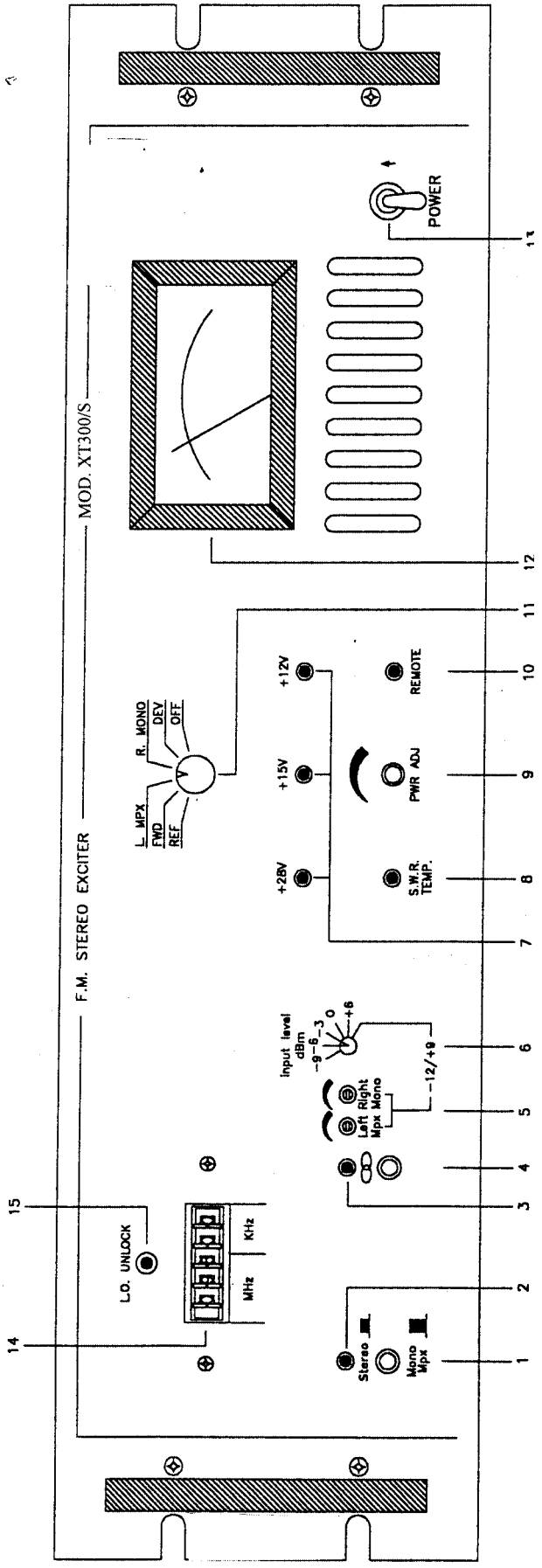

F.M. STEREO EXCITER
MOD. XT300/S
POWER
R. MONO
DEV
OFF
MPX
FWD
REF
+12V
+15V
+28V
REMOTE
PWR ADJ
S.W.R.
TEMP.
Input level
dBm
-9 -6 -3 0 +6
-12/+9
Left
Right
Mpx
Mono
LO. UNLOCK
KHz
MHz
Stereo
Mono
Mpx
1
2
3
4
5
6
7
8
9
10
11
12
14
15

FIG. 1A

FRONT PANEL MONO/MPX VERSION VIEW DESCRIPTION (FIG.1B)

1	L/MPX & R/MONO LEVEL	L/MPX and R/Mono input level adjustable from -12 to +9 dBm
2	INPUT LEVEL	Input signal attenuator adjustable in 5 steps from -9 to +6 dBm
3	VOLTAGES LEDS	Indicates the presence of the internal operating voltages +12V, +15V and +28V
4	SWR	Indicates that reflected power exceeds 30W
5	PWR ADJ	10-turn trimmer to regulate the power output of the exciter. AGC maintains the level set by this control
6	REM	Indicates that the exciter has been shut-down by remote control
7	MEASUREMENT SELECTOR	The measurement made by the meter corresponds to the position of this selector
8	METER	Analog meter used to display the following operating parameters of the exciter: Direct power f.s. 375W Reflected power f.s. 37.5W Deviation f.s. 100KHz Right channel input level f.s. +3dB Left channel input level f.s. +3dB
9	POWER	Supply on/off switch
10	MHz/KHz	Rotary frequency selector
11	L.O. UNLOCK	Indicates that the VCO is not locked to the reference frequency. The output power will drop to zero in this condition

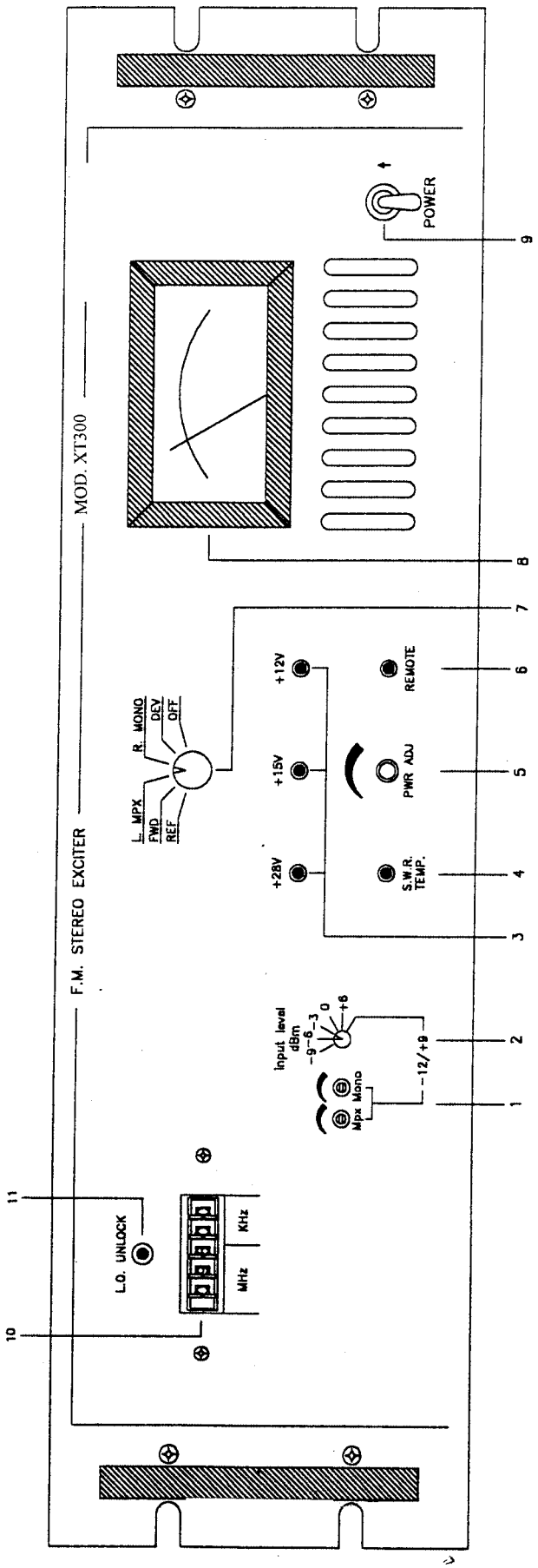

F.M. STEREO EXCITER
MOD. XT300
POWER
9
8
7
6
5
4
3
2
1
11
10
R. MONO
DEV
OFF
L. MPX
FWD
REF
+12V
+15V
+28V
REMOTE
PWR ADJ
S.W.R.
TEMP.
Input level
dBm
-9 -6 -3 0 +6
-12/+9
Mpx Mono
L.O. UNLOCK
KHz
MHz

FIG. 1B

REAR PANEL View Description (Fig, 2)

1	MAINS VOLTAGE SOCKET	Mains Voltage Socket
2	VOLTAGE CHANGER	Mains Voltage Changer: Connect: 0-100V for 100V A.C. Input Connect: 0-120V for 120V A.C. Input Connect: 0-220V for 220V A.C. Input Connect: 0-240V for 240V A.C. Input
3	D.C. LINE FUSE	Protection for D.C. line R.F. module
4	R.F. MUTE	BNC connector. Connecting the center conductor to ground will cause the RF output power level to drop to zero and stay there until the short is removed. When used with a Bext, Inc. amplifier, this connector should be connected to the "REMOTE" output of the power amplifier.
5	FAN	Fan-assisted cooling for the power stage and power supply
6	TELEMETRY TERMINALS	10 Pin Telemetry card 1-2 Audio GND 3-10 GND 4 Forward power 5 Reflected power 6 VPA 7 IPA 8 SWR Alarm/Temp 9 Unlock alarm
7	A.C. LINE FUSE	Protection fuse for A.C. line
8	R.F. OUTPUT	N-type connector, 50 Ohm
9	R.F. TEST POINT	-60 dB output referred to the output level
10	P.A. FUSE	Protection fuse for the Switching Power Supply
11	EXT. RFL FEEDBACK	BNC connector, external Reflected Feedback Input
12	EXT. AGC	BNC connector, external AGC input
13	RIGHT (MONO)	BNC connector for FCC unbalanced version: Cannon XLR for CCIR version with balanced input
14	LEFT (MPX)	BNC connector for FCC unbalanced version: Cannon XLR for CCIR version with balanced input
15	SCA1	BNC connector, unbalance SCA1 input
16	SCA2	BNC connector, unbalance SCA2 input or output (internally selectable) for pilot tone (i.e. for RDS encoder)

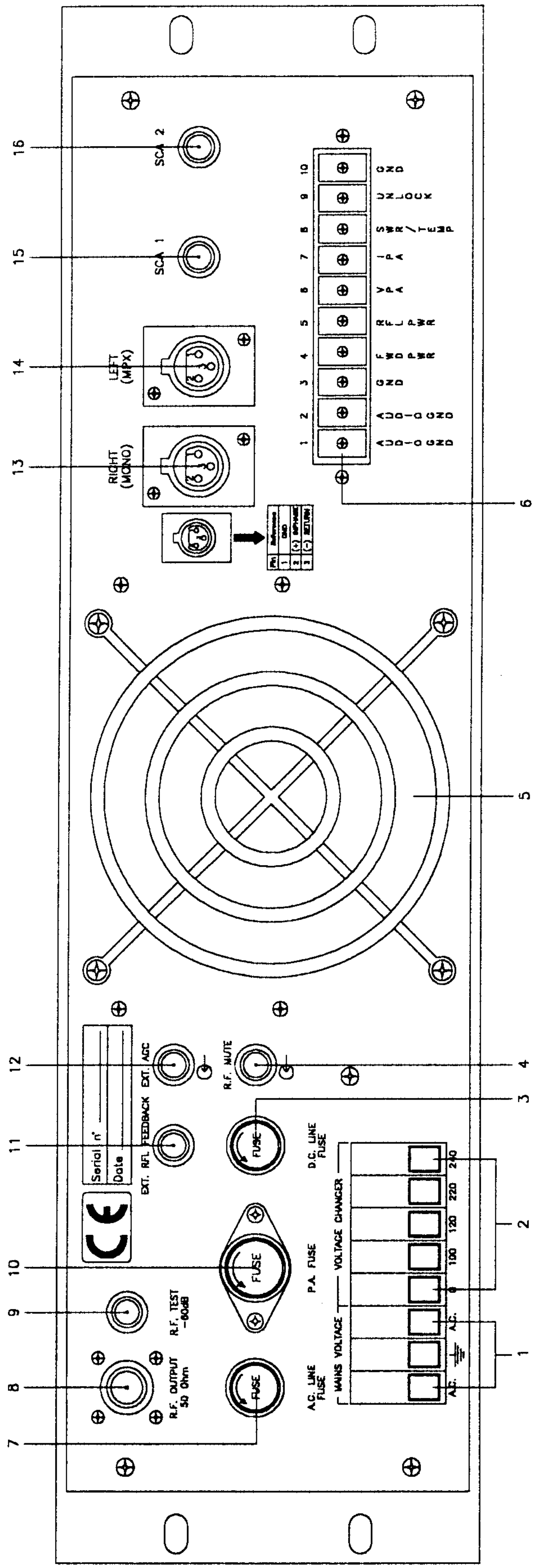

SCA 2
SCA 1
LEFT (MPX)
RIGHT (MONO)
EXT. AGC
R.F. MUTE
EXT. RFL FEEDBACK
D.C. LINE FUSE
P.A. FUSE
VOLTAGE CHANGER
WAINS VOLTAGE
A.C. LINE FUSE
R.F. TEST -60dB
R.F. OUTPUT 50 Ohm
FUSE
Serial n°
Date
A.C.
0
100
120
220
240
GND
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

FIG. 2

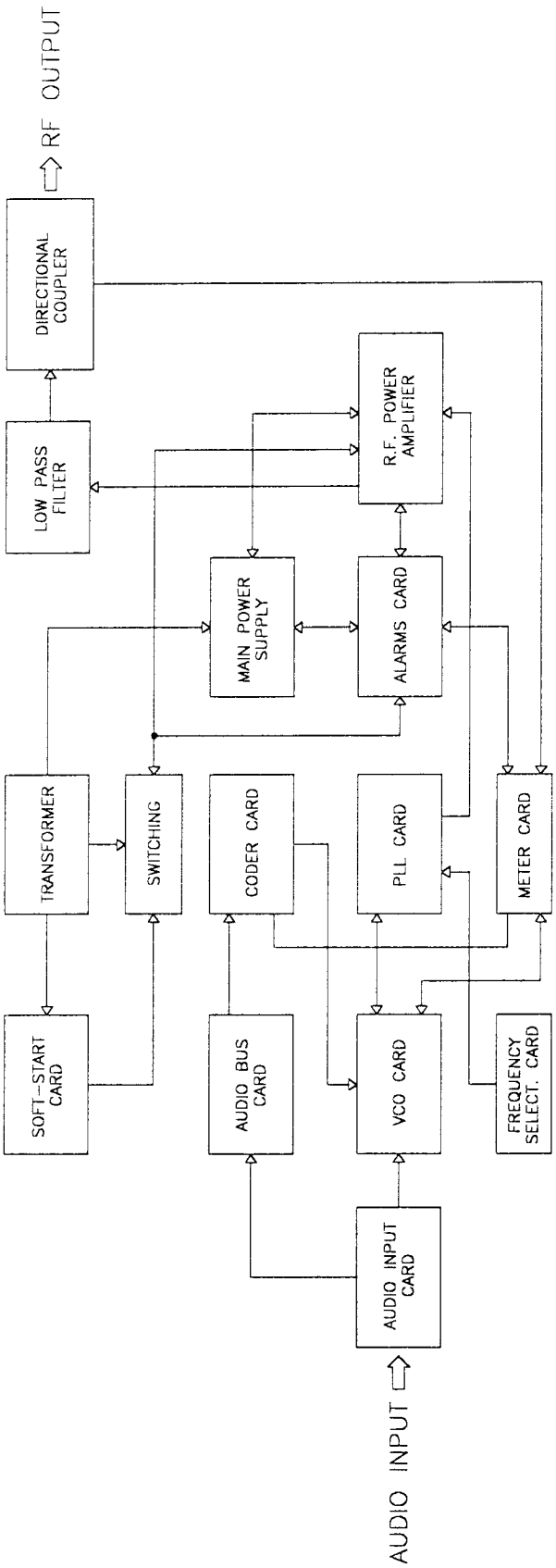

RF OUTPUT
DIRECTIONAL COUPLER
LOW PASS FILTER
R.F. POWER AMPLIFIER
MAIN POWER SUPPLY
ALARMS CARD
TRANSFORMER
SWITCHING
CODER CARD
PLL CARD
METER CARD
SOFT-START CARD
AUDIO BUS CARD
VCO CARD
FREQUENCY SELECT. CARD
AUDIO INPUT CARD
AUDIO INPUT

FIG. 3

BOTTOM VIEW DESCRIPTION (PHOTO 1)

1 Meter card

2 Stereo coder card (for Stereo Version)
Mono/MPX card (for Mono Version)

3 Audio bus card

4 Power supply card

5 Alarms card

6 Audio input card

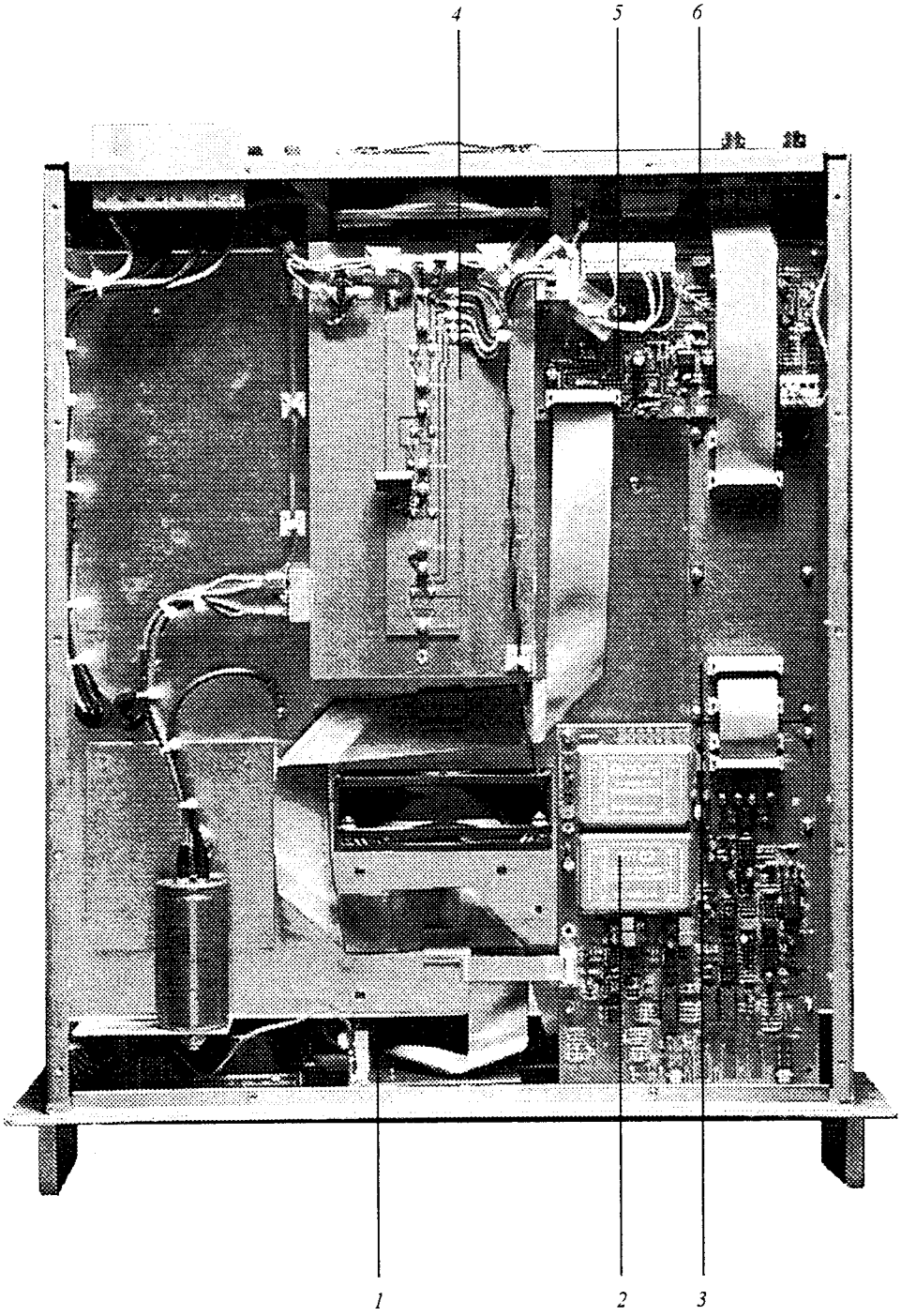


PHOTO 1

UPPER VIEW (PHOTO 2)

1 Frequency Selector card

2 Meter card

3 Soft-Start card

4 R.F. Power Amplifier- Driver Stage

5 Analog Meter

6 Transformer

7 VCO

8 Audio Input card

9 PLL

10 R.F. Power Amplifier-Final Stage

11 Low Pass Filter

12 Switching Power Supply

13 Directional Coupler

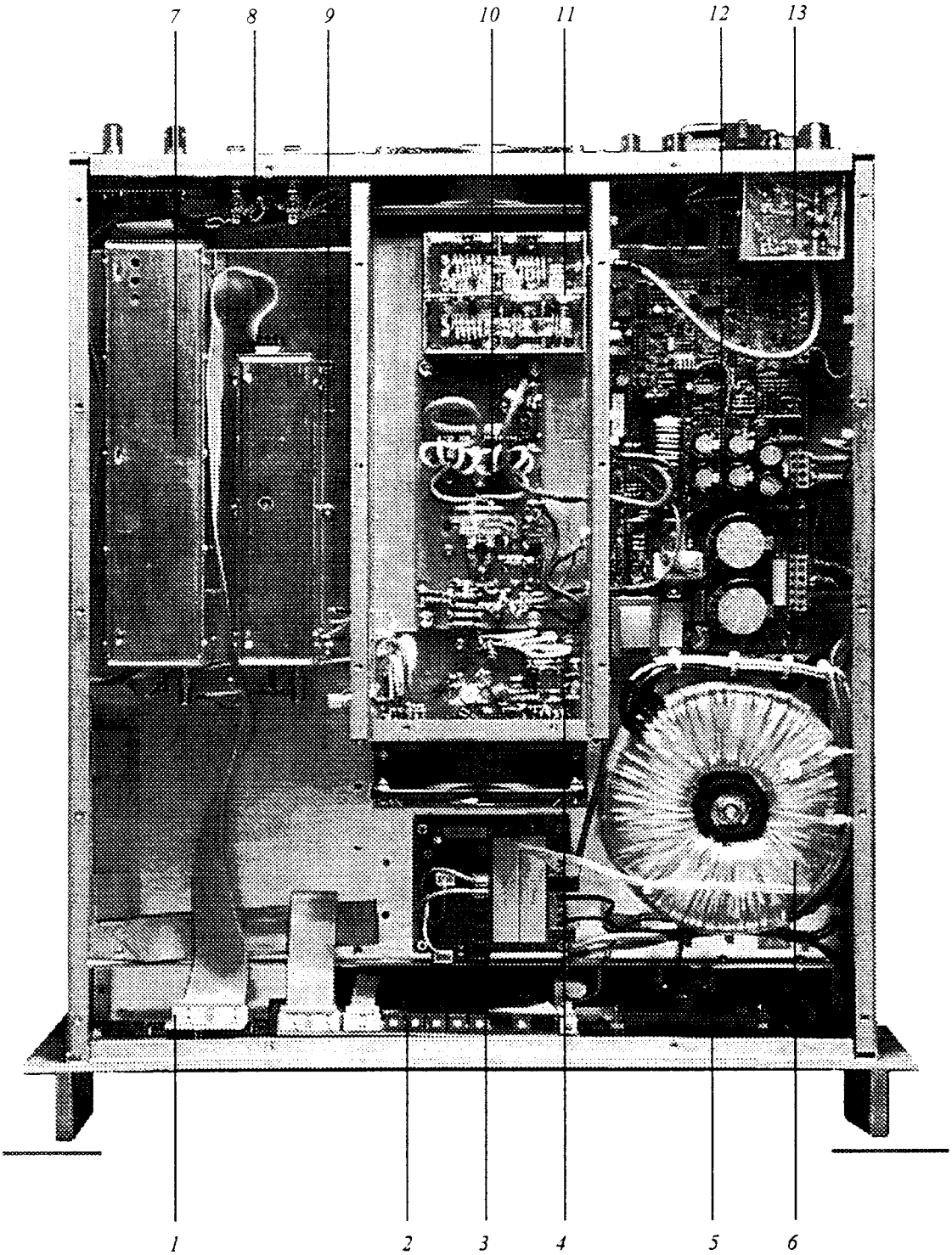


PHOTO 2

CHAPTER 3

INSTALLATION

3.1 INTRODUCTION

This chapter contains the information required for installation of the XT300 exciter and for preliminary checks.

3.2 UNPACKING

Remove the unit from its packaging and before any other operation, check for damage that the unit may have suffered in transit and check to be sure all front panel controls are functioning.

3.3 INSTALLATION

1) Check that the line voltage selector is correctly set for the local supply. Check also that the A.C. Line Protection Fuse (Fig.2 Item 7) is mounted on the rear panel. The currrent sizes of the fuses are as follows:

220-240V	6.3A
100-120V	12.5A

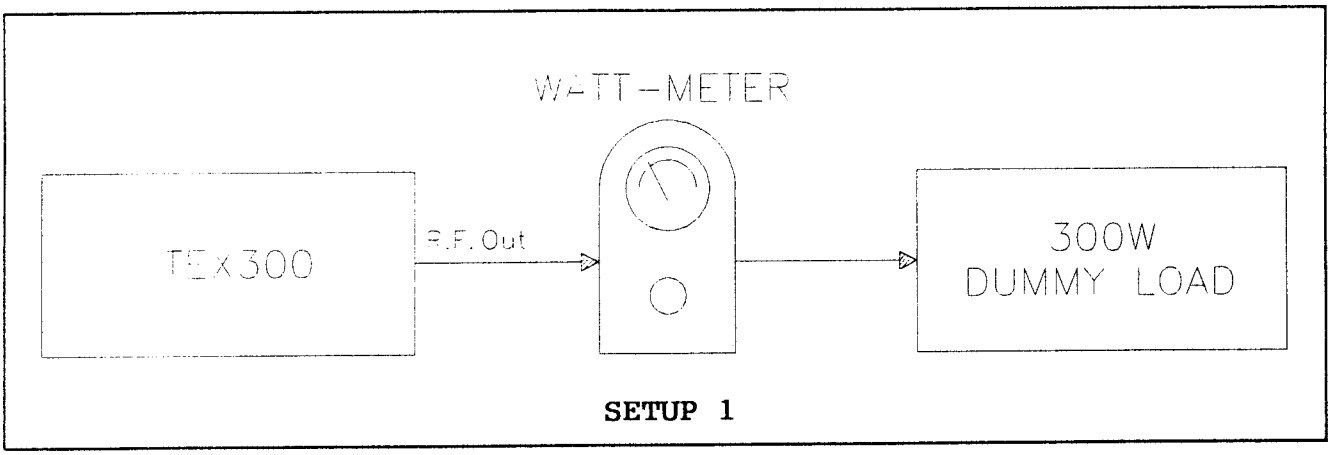
2) Now ensure that the PWR ADJ control (Fig. 1A Item 9 or Fig. 1B Item 5) is rotated fully counterclockwise, using a small screwdriver (the pot is a ten turn pot so care should be taken to verify the minimum position). Units are normally shipped with this control at minimum.

WARNING: When the unit is switched on with the control at its minimum position, power output is about 10W.

3) Connect a dummy load with a power rating of at least 300W continous to the R.F. output, situated on the rear panel of the unit. It is advisable to connect a bypass wattmeter in series with this load in order to verify the accuracy of the units own internal wattmeter (see setup 1).

4) Connect a switch, via a cable, to the R.F. Mute connector (Fig. 2 Item 4) on the rear panel so that the switch is able to short the central conductor to its ground. Leave the switch in the short-circuit position.

5) Switch the unit's ON/OFF switch (Fig. 1A Item 13 or Fig. 1B Item 9) to the OFF position.



SETUP 1

6) Connect the line cord. (Fig.2 Item 1)

(It is essential that the unit be properly grounded to ensure both the safety of the operator as well as the correct functioning of the equipment.)

7) Switch the power switch (Fig. 1A Item 13 or Fig 1B Item 9) to the ON position and check that the three green internal voltage LEDs, (Fig. 1A Item 7 or Fig. 1B Item 3) and the red unlock LED (Fig. 1A Item 15 or Fig. 1B Item 11) are all on. Select the desired operating frequency using the corresponding selector. The red UNLOCK LED should switch off within 30 seconds, indicating that the oscillator has locked onto the operating frequency. The frequency selector comprises five figures of which three to the left of the decimal point represent (from left to right) hundreds MHz, tens MHz, and MHz. The two figures to the right of the decimal point represent (from left to right) hundreds of KHz and tens of KHz.

EG: 098.45= ninety eight megahertz and four hundred and fifty kilohertz.

EG: 103.94= one hundred and three megahertz and nine hundred and forty kilohertz.

Furthermore, if a frequency is selected beyond the two limits of the 87.5-108 band, the amplifier will continue to work even though the displayed frequency no longer corresponds to the operating frequency of the unit.

Transmitting outside the legal band (87.5-108 MHz) is an offense and may lead to prosecution.

8) After having verified that the UNLOCK LED is off and that the unit is therefore locked to the selected operating frequency, switch the switch connected to the REMOTE connector so as to remove the short circuit between the center conductor and the ground. The R.F. output is now enabled and should correspond to a power level of about 10W. To check this reading, select FWD on the meter selector and read the power from 375W FSD scale.

9) Using a small screwdriver, rotate the PWR ADJ control clockwise; the power output should increase progressively to a maximum of 300W. Check the value with the bypass wattmeter which should be within +/- 10% of the front panel meter.

10) With the power output at 300W, select a new operating frequency well away from the current value.
Eg: 107 MHz: the UNLOCK LED should switch to on and the power output should fall to zero at the same time. Only when the UNLOCK LED switches off (unit locked to new frequency) should the power output resume its previous level.

11) Automatic power control check.
It is advisable to start this procedure with the operating frequency set to 87.50 MHz. When locked to this frequency, the PWR ADJ control should be adjusted for an output power of 150W. Now, with no further adjustment of the PWR ADJ control, change the operating frequency in steps of 4-5 MHz, ensuring that the output power remains constant at 150W.

12) SWR alarm check.
For this test, adjust the PWR ADJ control for a power output of 10W. Disconnect the output load and check that the SWR LED lights. Now adjust the PWR ADJ control to check that the unit switches on again at a reflected power level of about 10% of the output power. Turn the PWR ADJ control for maximum power and check that the reflected power does not exceed 30W. Reconnect the output load and check that REF falls to zero, the SWR LED goes out and the PWR FWD jumps to 300W.

13) Now short circuit the center conductor of the remote input to ground and the output should drop instantly to zero. Removing the short should cause the power output to return, gradually, to its previous level.

14) Deviation reading check.
The maximum input sensitivity is determined by the position of the input level control. In the -12/+9 position, the sensitivity will depend on the L/MPX and R/MONO controls. Put the selector in the DEV position. Connect a low-distortion audio generator to the LEFT and RIGHT inputs. Inject a 400 Hz tone at a level of 0dBm (775mVrms=2.2Vpp). Put the INPUT LEVEL control in the 0dBm position. Select stereo mode (corresponding LED will switch on). Enable the pilot using the relevant switch (the green LED will switch on). With the selector in the R/MONO position, check that the reading is 0dBm, measured on the +3db FSD scale. Repeat the operation for the L/MPX. Check that the deviation reading is 100%.

3.4 OPERATION USING THE INTERNAL STEREO CODER (only for stereo version)

1) Inject the pilot tone checking that the corresponding LED switches on.

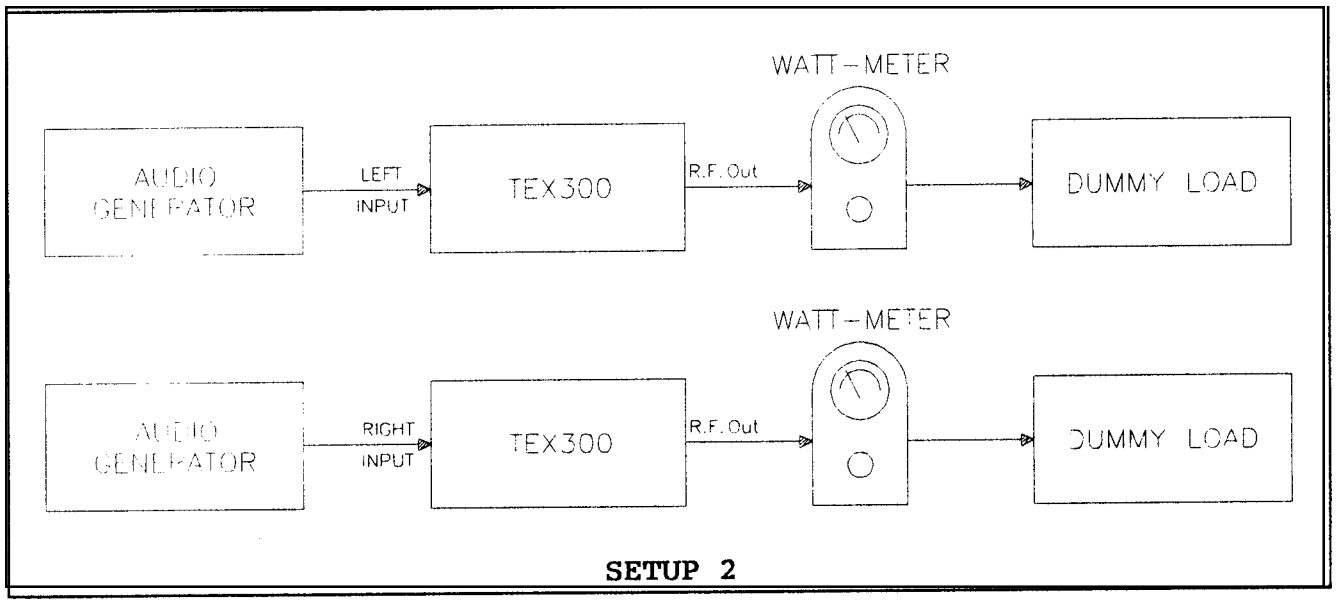
2) Select STEREO operation confirmed by the corresponding LED.

3) Select the sensitivity of the audio LEFT/RIGHT inputs to match the signal level being supplied to the unit.

4) Connect the signal source to the LEFT/RIGHT inputs. These are balanced inputs (see setup 2).

5) Check on the internal analog meter that the L/R signal levels are those expected, selecting the desired input with the corresponding control.

6) The effective modulation level may be measured on the analog multimeter by selecting DEV with the corresponding selector.



SETUP 2

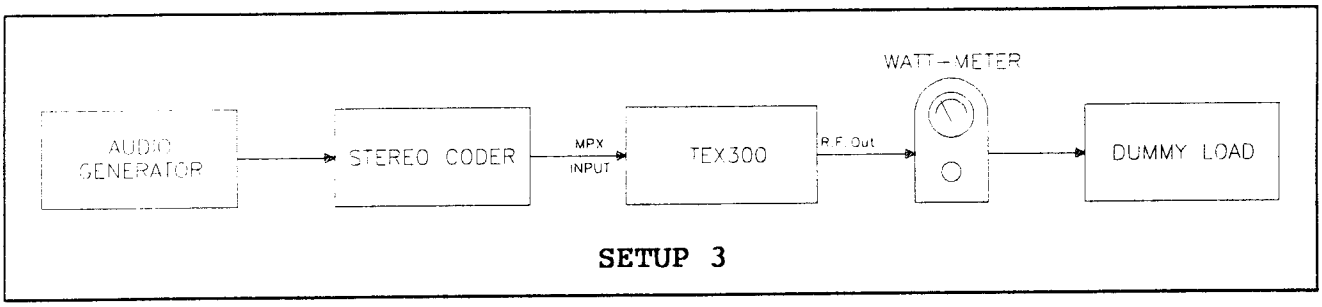
3.5 CONNECTION OF AN EXTERNAL STEREO-PHONIC SOURCE

1) Connect the stereo source's output to the MPX input of the unit (see setup 3).

2) Adjust the stereo encoder to obtain just the 19 KHz subcarrier output and ensure the total absence of signal on the LEFT and RIGHT inputs of the encoder.

3) Adjust the output level of the encoder to obtain the correct level as displayed on the analog meter of the XT300.

4) Inject audio signals into the LEFT and RIGHT inputs of the encoder and adjust the sensitivity of the input to obtain a peak reading of MAX= 75KHz with both channels enabled.



SETUP 3

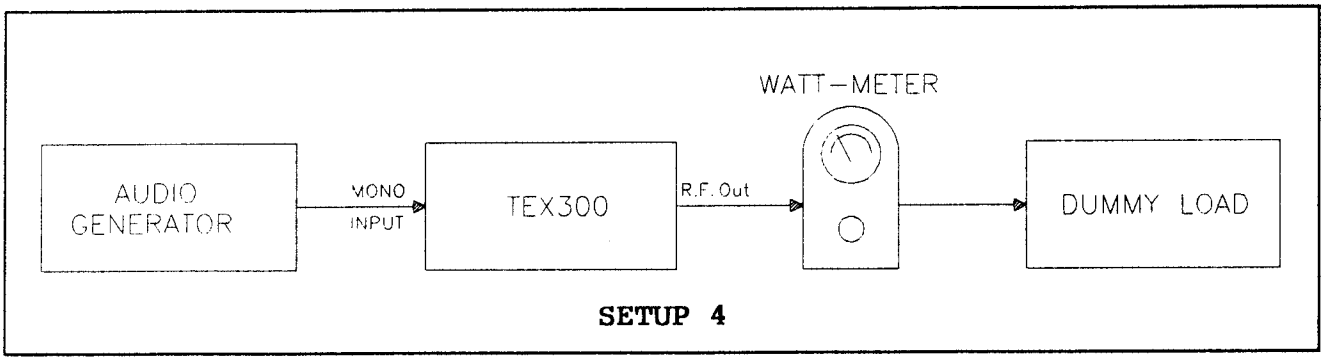
3.6 MONOPHONIC TRANSMISSION

1) Connect the signal source (audio mixer, receiver, compressor etc.) to the MONO input. This input is unbalanced (see setup 4).

2) Select the desired input level.

3) Adjust the signal level of the equipment connected to the XT300 (with the audio signal present) for a peak reading of DEV MAX=75KHz

NOTE: International standards permit a maximum deviation (DEV MAX) of 75KHz for frequency modulated, radiophonic transmissions. Exceeding this limit will only result in the degradation of the signal quality. In the case of mono transmissions the stereo input is available for frequencies between 15 KHz and 100KHZ (i.e. subcarriers for SCA, RDS etc.).



SETUP 4

Pages 35-68 intentionally left blank

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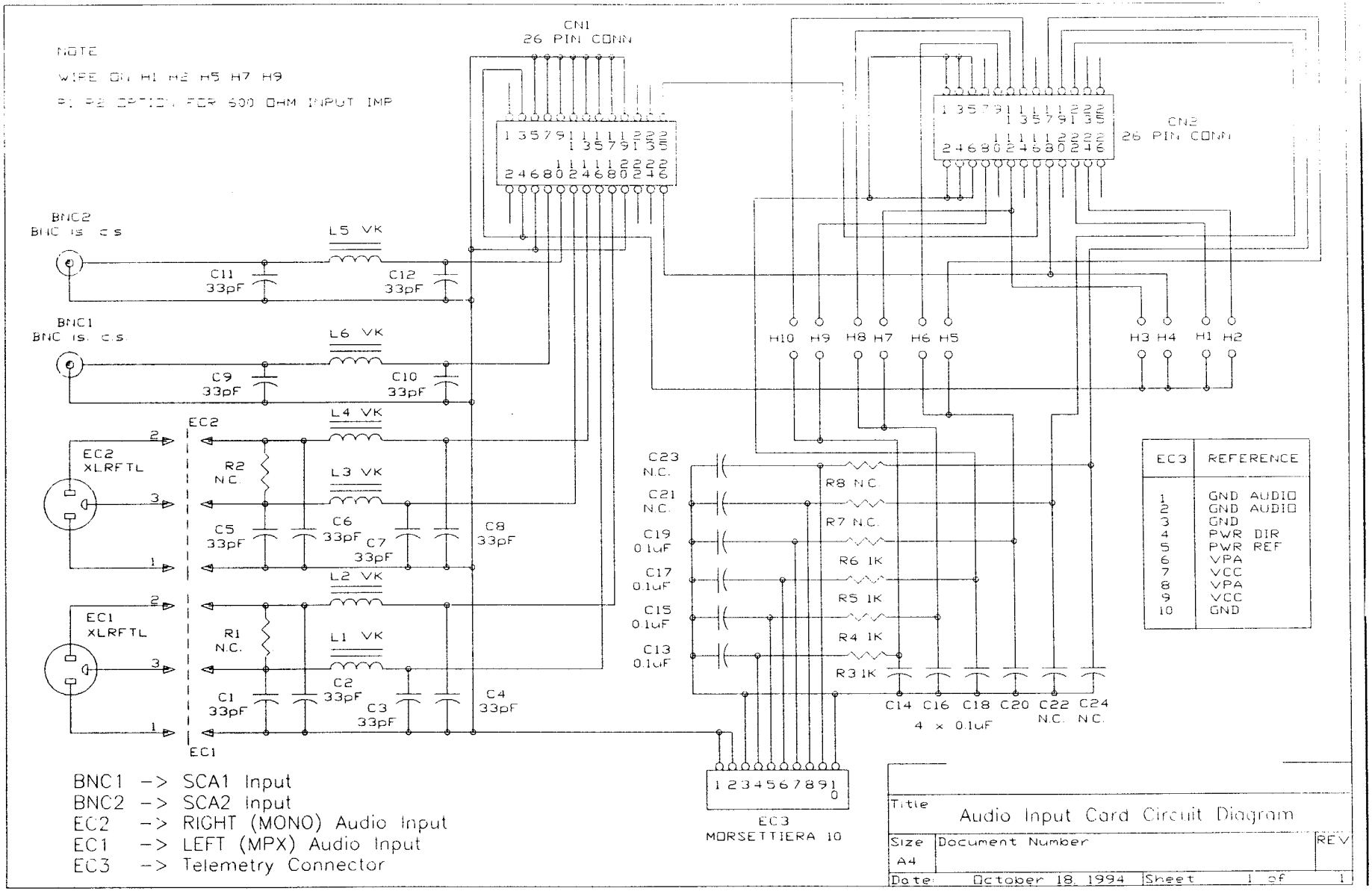
AUDIO INPUT CARD

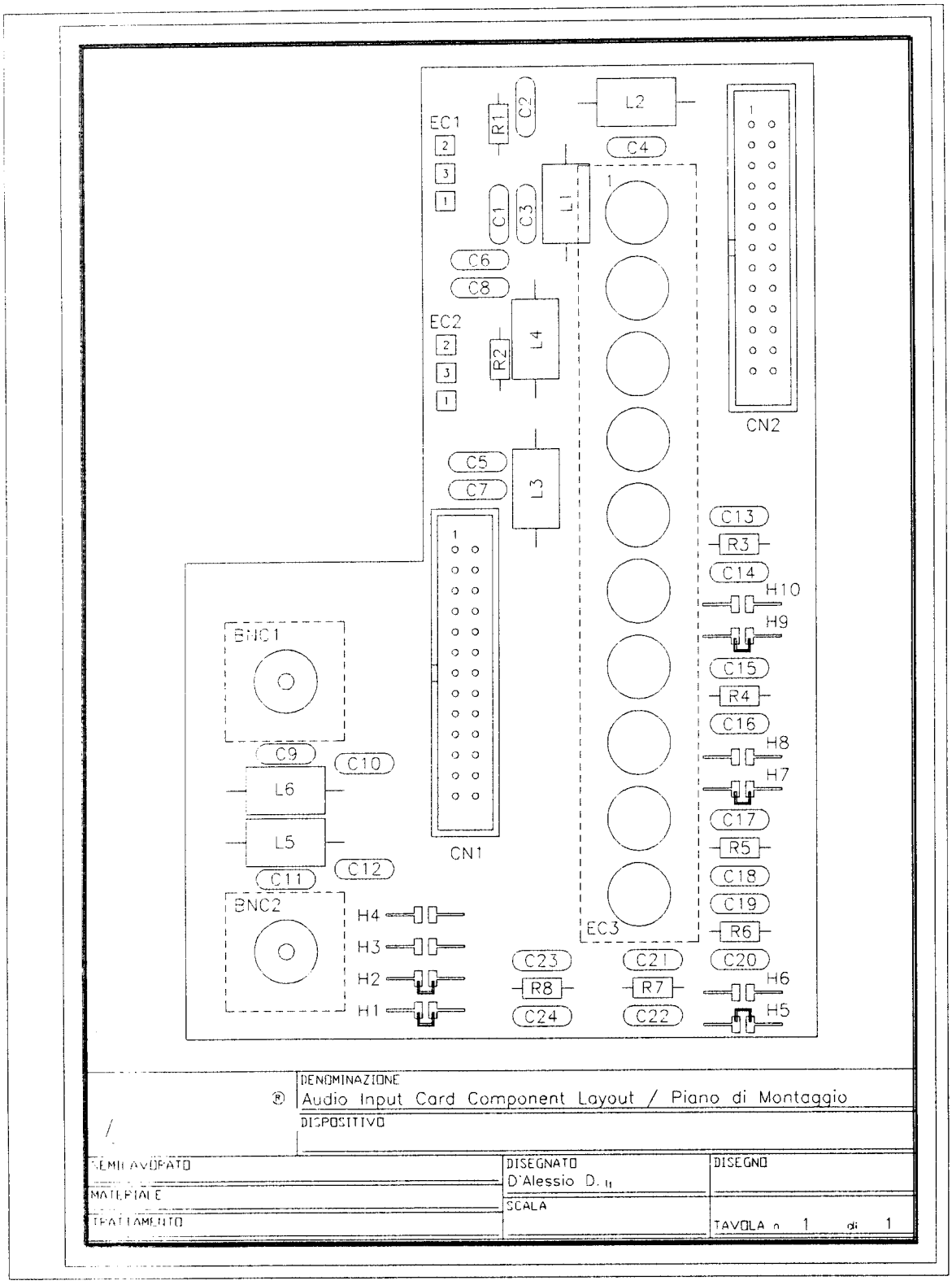
A) Circuit Diagram

B) Bill of Materials

C) Component Layout


NOTE
WIRE ON H1 H2 H5 H7 H9
P1 P2 OPTION FOR 600 OHM INPUT IMP
CN1
26 PIN CONN
CN2
26 PIN CONN
BNC2
BNC 1s. c.s
BNC1
BNC 1s. c.s
L5 VK
L6 VK
L4 VK
L3 VK
L2 VK
L1 VK
C11 33pF
C12 33pF
C9 33pF
C10 33pF
C5 33pF
C6 33pF
C7 33pF
C8 33pF
C1 33pF
C2 33pF
C3 33pF
C4 33pF
R2 N.C.
R1 N.C.
EC2
XLRFTL
EC1
XLRFTL
H10 H9 H8 H7 H6 H5
H3 H4 H1 H2
C23 N.C.
C21 N.C.
C19 0.1uF
C17 0.1uF
C15 0.1uF
C13 0.1uF
R8 N.C.
R7 N.C.
R6 1K
R5 1K
R4 1K
R3 1K
C14 C16 C18 C20 C22 C24
4 x 0.1uF
N.C. N.C.
EC3 REFERENCE
1 GND AUDIO
2 GND AUDIO
3 GND
4 PWR DIR
5 PWR REF
6 VPA
7 VCC
8 VPA
9 VCC
10 GND
EC3
MORSETTIERA 10
BNC1 -> SCA1 Input
BNC2 -> SCA2 Input
EC2 -> RIGHT (MONO) Audio Input
EC1 -> LEFT (MPX) Audio Input
EC3 -> Telemetry Connector
Title
Audio Input Card Circuit Diagram
Size A4
Document Number
REV
Date: October 18, 1994
Sheet 1 of 1

Item	Quantity	Reference	Part	Description	Part Order Code
1	4	R3,R4, R5,R6	1K	RESISTOR 1/4W 5%	RSC1/4JK0001
2	12	C1,C2,C3, C4,C5,C6, C7,C8,C9, C10,C11,C12	33pF	CERAMIC CAPACITOR NP0	CKM330BJ600C
3	8	C13,C14, C15,C16, C17,C18, C19,C20	0.1uF	CERAMIC CAPACITOR	CKM104BK600P
4	6	L1,L2,L3, L4,L5,L6	VK	RF CHOKE	IMPVK00A
5	2	EC1,EC2	XLRFTL	XLR FEMM. DA TELAIO	CNTXLRFP3P
6	1	EC3	MORSET. 10	MORSETT. TEL. 10 CONT.	MORSP10P
7	2	CN1,CN2	26 P CONN.	CONN. M 2*13 P 2.54	CNTMCSFC26P
8	2	BNC1,BNC2	BNC IS.CS.	CONN. BNC A STAMP. IS.	CNTBNCFCSIS
9	10	H1,H2,H3, H4,H5,H6, H7,H8, H9,H10	WIRE JUMP.	PONTICELLO A FILO	WIREJUMPER
10	8	R1,R2,R7, R8,C21,C22, C23,C24	N.C.	NOT CONNECTED	

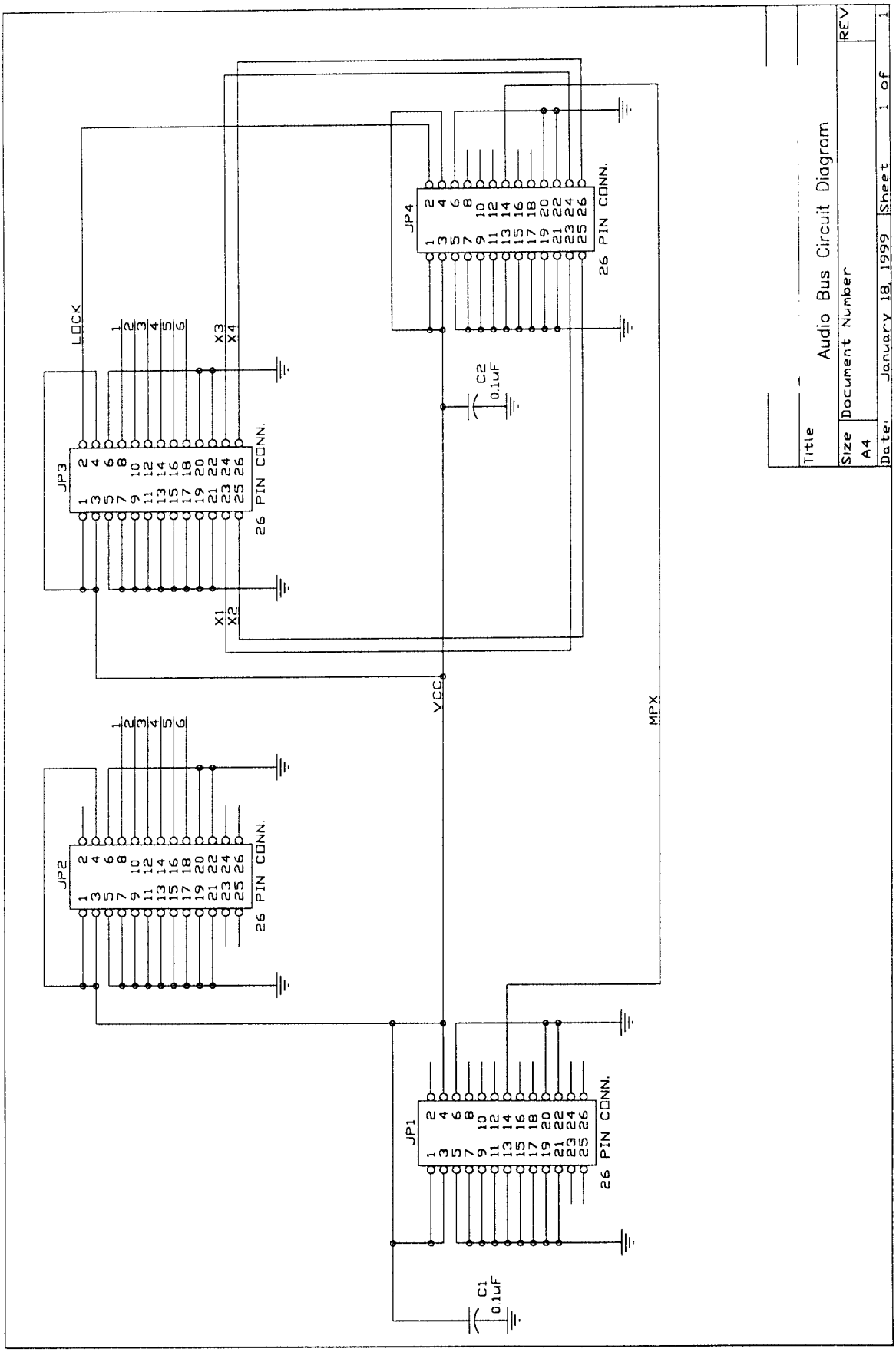

EC1
EC2
EC3
R1
C2
L2
C4
C1
C3
L1
C6
C8
R2
L4
C5
C7
L3
CN1
CN2
BNC1
BNC2
C9
C10
L6
L5
C11
C12
H4
H3
H2
H1
C13
R3
C14
H10
H9
C15
R4
C16
H8
H7
C17
R5
C18
C19
R6
C20
H6
H5
C23
R8
C24
C21
R7
C22
DENOMINAZIONE
Audio Input Card Component Layout / Piano di Montaggio
DISPOSITIVO
SEMILAVORATO
MATERIALE
TRATTAMENTO
DISEGNATO
D'Alessio D.
SCALA
DISEGNO
TAVOLA n 1 di 1

BUS AUDIO CARD

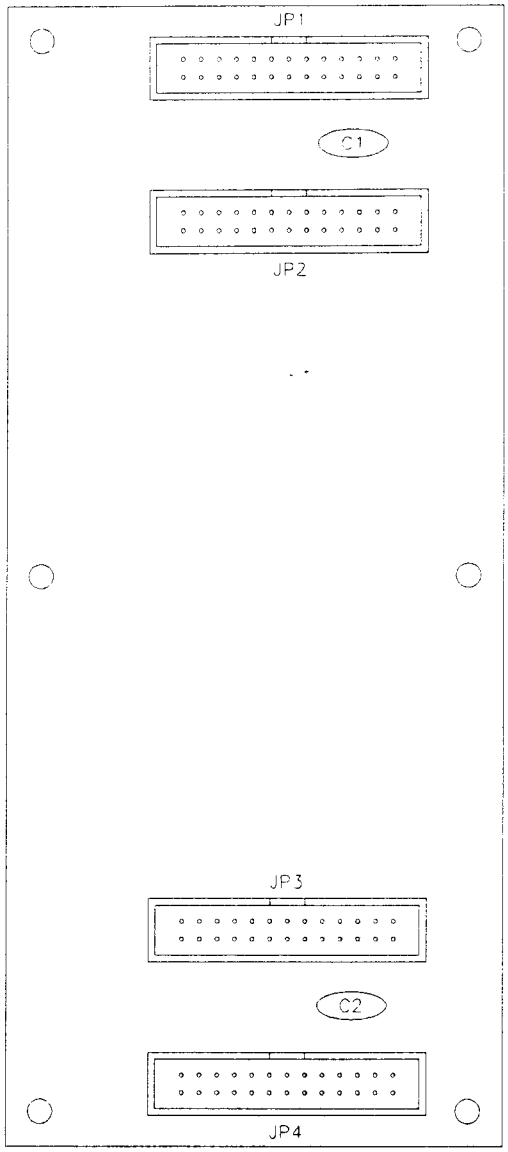
A) Circuit Diagram

B) Bill of Materials

C) Component Layout


Audio Bus Circuit Diagram
Title
Size A4
Document Number
REV
Date: January 18, 1999
Sheet 1 of 1
JP1
JP2
JP3
JP4
26 PIN CONN.
LOCK
X1
X2
X3
X4
VCC
MPX
C1
0.1uF
C2
0.1uF

Audio Bus Card			Bill Of Materials		Page 1
Item	Quantity	Reference	Part	Description	Part Order Code
1	2	C1,C2	0.1μF	CERAMIC CAPACITOR	CKM104BK600P
2	4	JP1,JP2, JP3,JP4	26 PIN CONN	CONN. M 2*13 P 2.54	CNTMCSFC26P



	DENOMINAZIONE Audio Bus Card Component Layout / Piano di Montaggio
	DISPOSITIVO

SEMILAVORATO	DISEGNATO D'Alessio D. 18/01/99	DISEGNO
MATERIALE	SCALA	
TRATTAMENTO		TAVOLA n. di

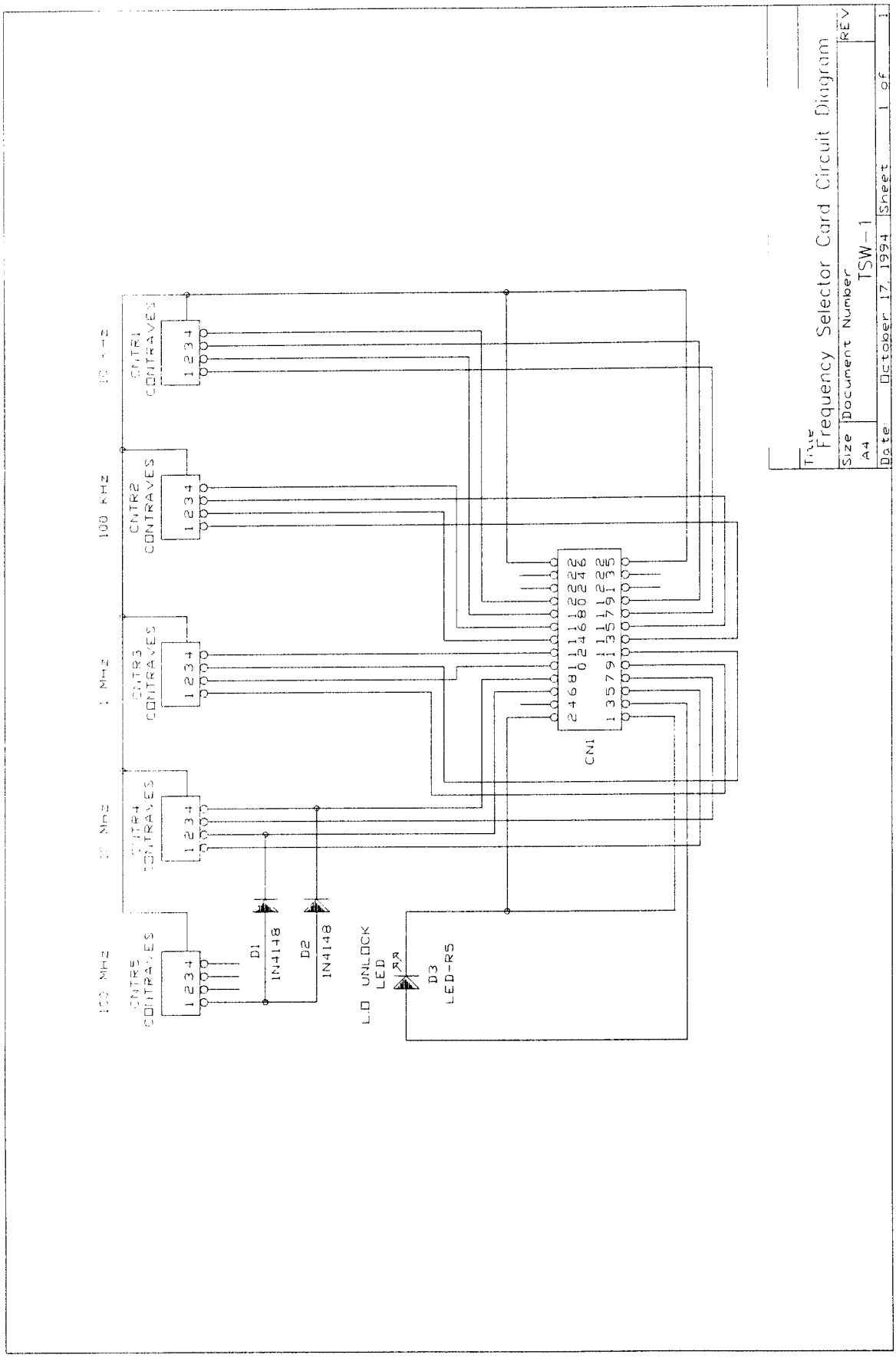
CONTRAVES CARDS

1) TSwitch-1 Card

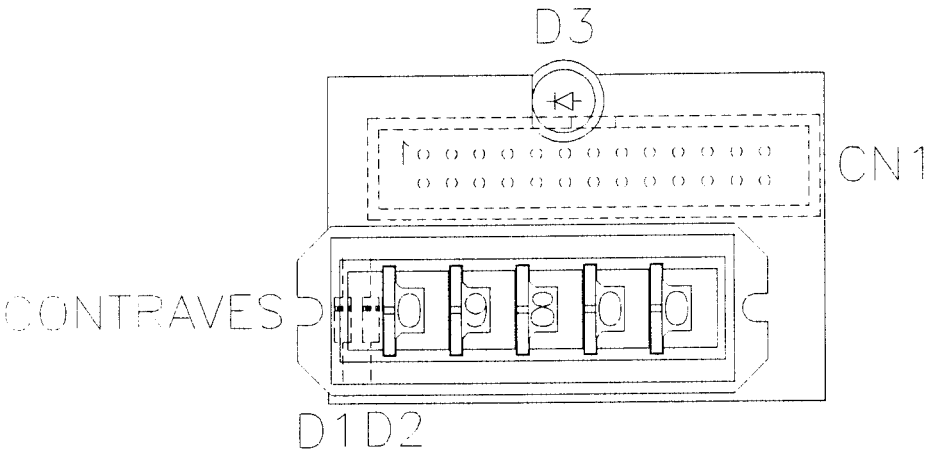
A) Circuit Diagram
B) Bill of Materials
C) Component Layout

2) TSwitch-3 Card

A) Circuit Diagram
B) Bill of Materials
C) Component Layout


Frequency Selector Card Circuit Diagram
REV
Size
A4
Document Number
TSW-1
Date
October 17, 1994
Sheet
1 of
1
CNTR1
CONTRAVES
CNTR2
CONTRAVES
CNTR3
CONTRAVES
CNTR4
CONTRAVES
CNTR5
CONTRAVES
100 KHz
1 MHz
10 MHz
100 MHz
1 2 3 4
CN1
D1
IN4148
D2
IN4148
LD UNLOCK
LED
D3
LED-R5

Item	Quantity	Reference	Part	Description	Part Order Code
1	1	CN1	26 P CONN.	CONN. M 2*13 P 2.54	CNTMCSFC26P
2	5	CNTR1, CNTR2, CNTR3, CNTR4, CNTR5	CONTRAVES	COMMUTATORI BCD 15mm	COMBCD15
3	2	D1,D2	1N4148	SILICON DIODE	DIS1N4148
4	1	D3	LED-R5	RED LED DIODE	LEDRO05



	DENOMINAZIONE: Frequency Selector Card Component Layout / Piano di Montaggio	
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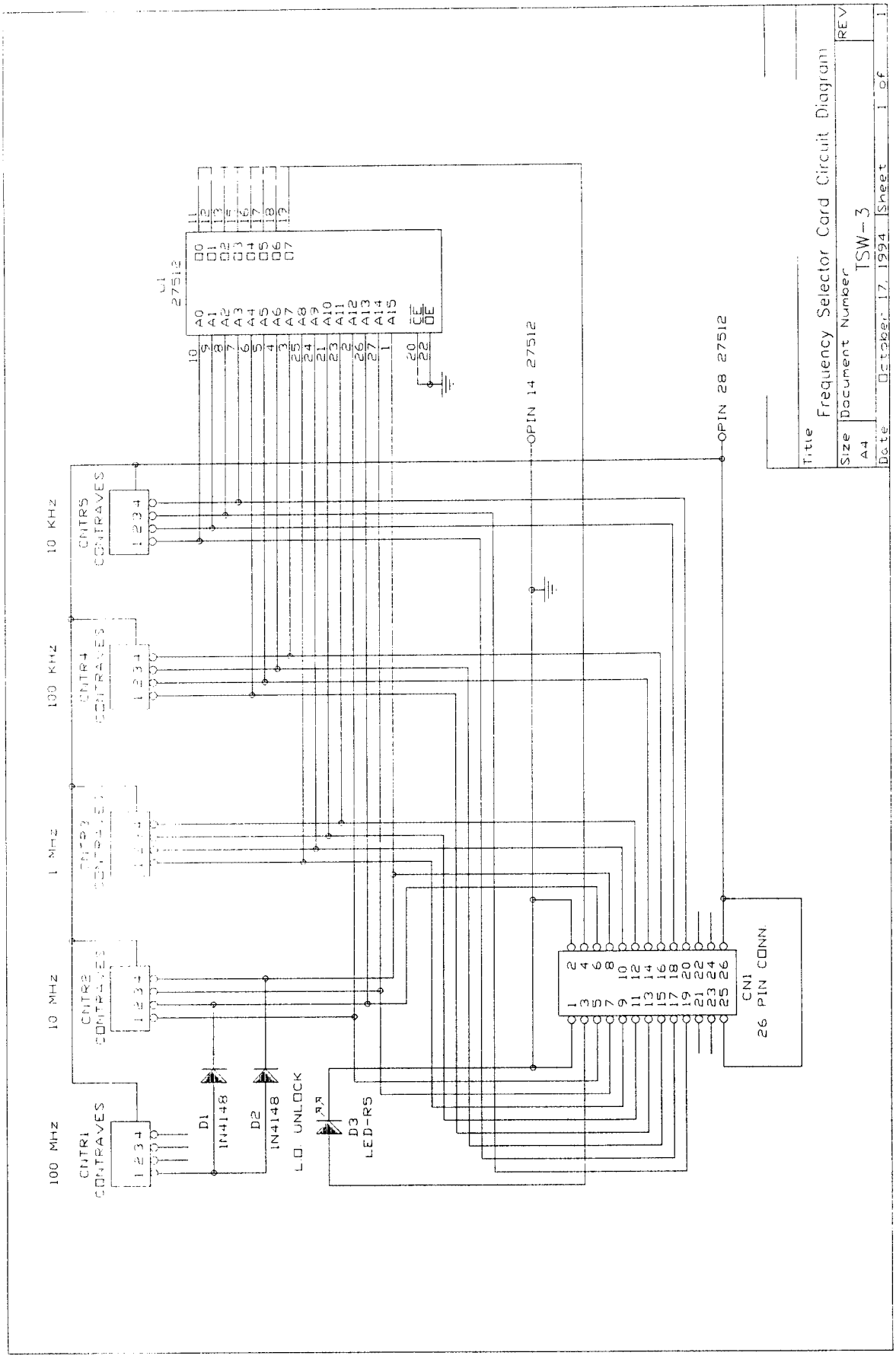
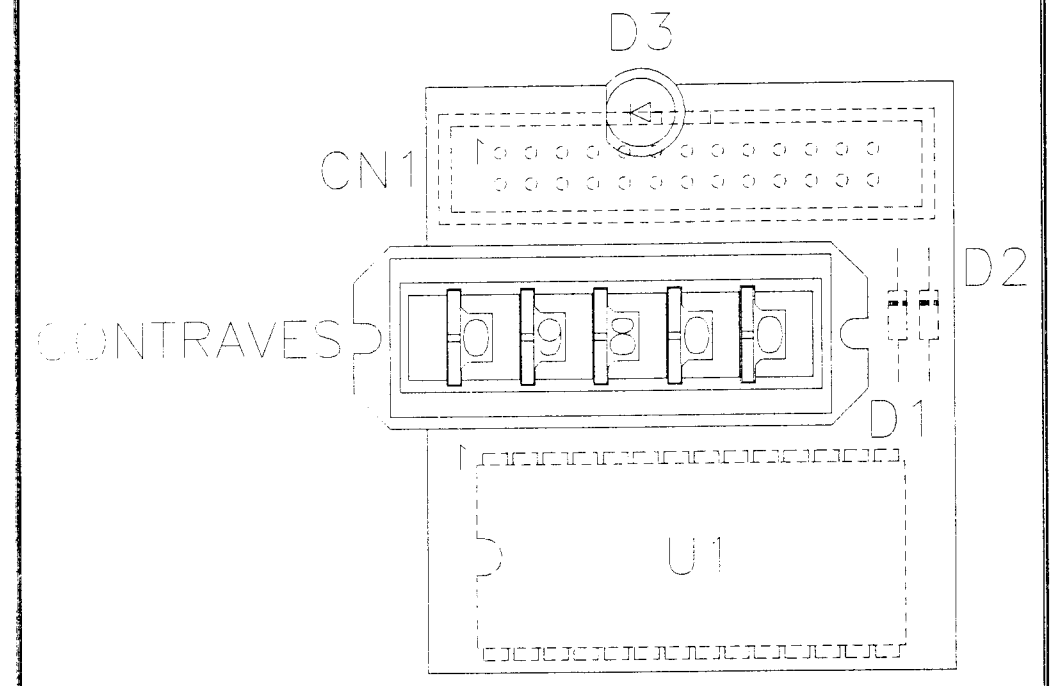
SEM	DISEGNATO: D'Alessio D.	DISEGNO: TSW-1
MATERIALE	SCALA	
TRATTAMENTO		TAVOLA n. di


Frequency Selector Card Circuit Diagram
Title
Size A4
Document Number
TSW-3
REV
Date October 17, 1994
Sheet 1 of 1
100 MHz
10 MHz
1 MHz
100 KHz
10 KHz
CNTR1 CONTRAVES
CNTR2 CONTRAVES
CNTR3 CONTRAVES
CNTR4 CONTRAVES
CNTRS CONTRAVES
1 2 3 4
U1 27512
A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14 A15
D0 D1 D2 D3 D4 D5 D6 D7
CE OE
OPIN 14 27512
OPIN 28 27512
D1 IN4148
D2 IN4148
LO UNLOCK
D3 LED-RS
CN1 26 PIN CONN

Item	Quantity	Reference	Part	Description	Part Order Code
1	1	CN1	26 P CONN.	CONN. M 2*13 P 2.54	CNTMCSFC26P
2	5	CNTR1, CNTR2, CNTR3, CNTR4, CNTR5	CONTRAVES	COMMUTATORI BCD 15mm	COMBCD15
3	2	D1,D2	1N4148	SILICON DIODE	DIS1N4148
4	1	D3	LED-R5	RED LED DIODE	LEDRO05
5	1	U1	27512	65,536x8 B CMOS EPROM	CID27512



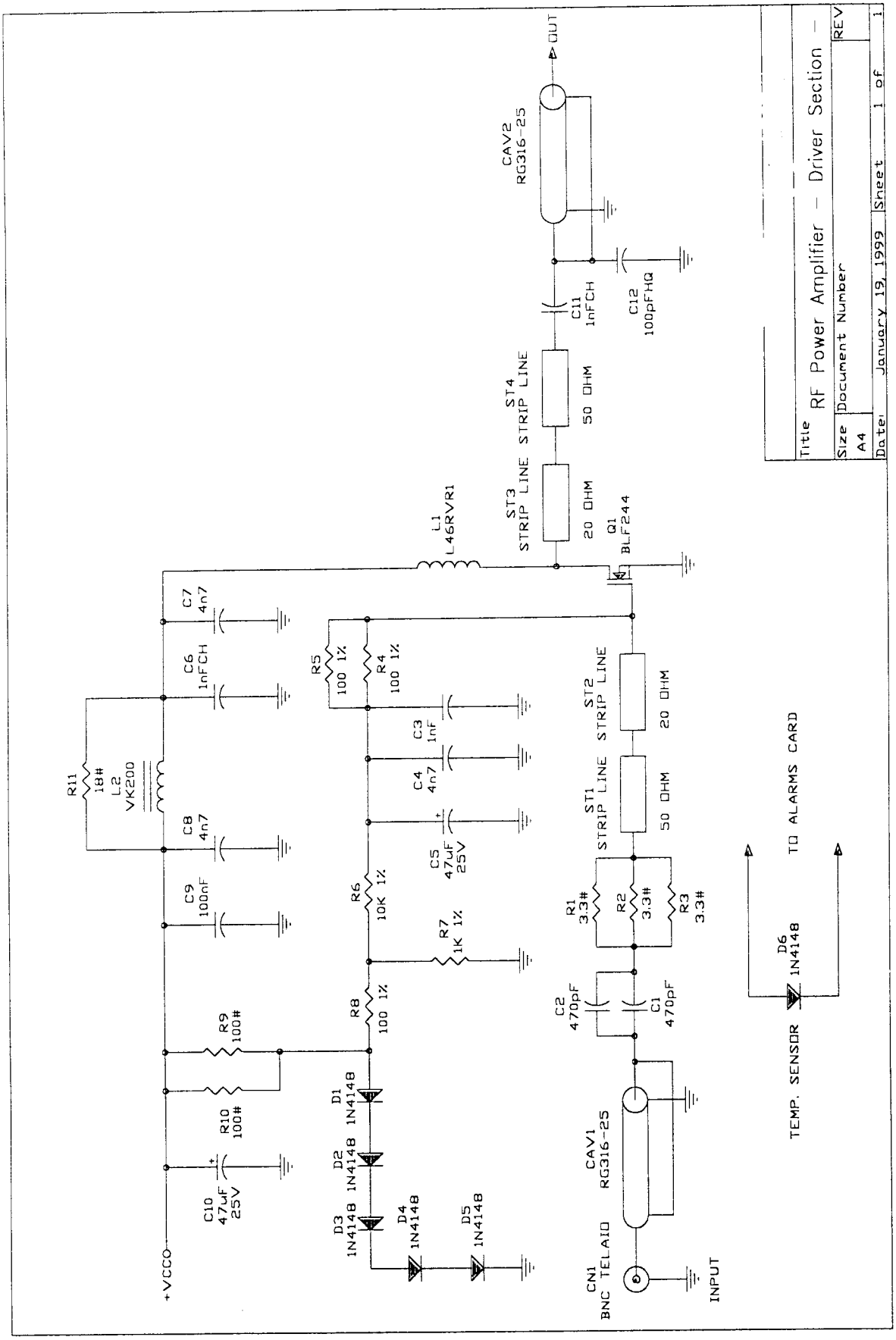
	DENOMINAZIONE: Frequency Selector Card Component Layout / Piano di Monatggio	
	DISPOSITIVO	
SEMILAVORATO	DISEGNATO: D'Alessio D.	DISEGNO: TSW-3
MATERIALE	SCALA	
TRATTAMENTO		TAVOLA n. di

R.F. POWER AMPLIFIER - DRIVER STAGE -

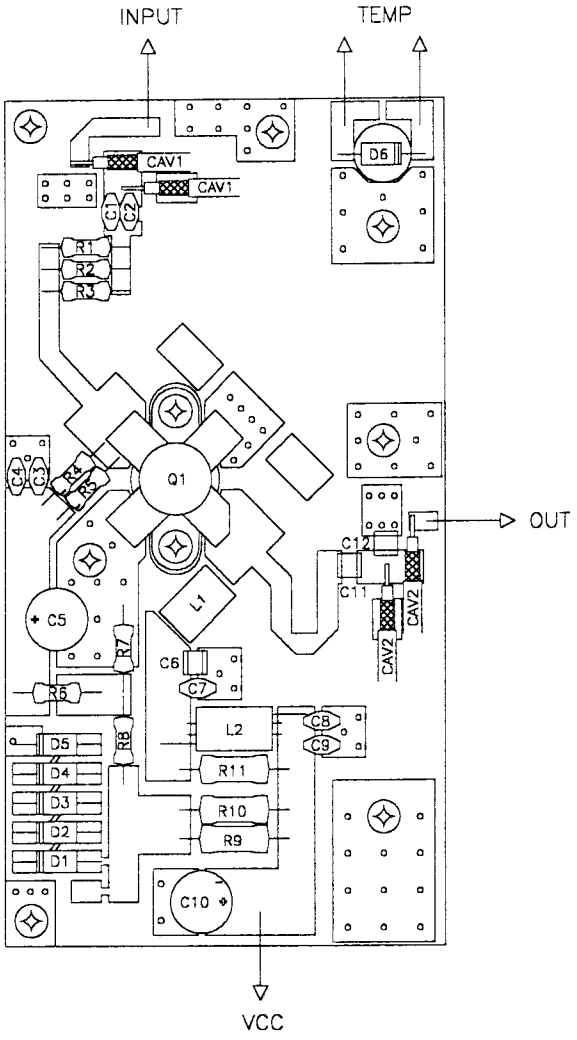
A) Circuit Diagram

B) Bill of Materials

C) Component Layout


RF Power Amplifier - Driver Section -
Title
Size A4
Document Number
REV
Date: January 19, 1999
Sheet 1 of 1
OUT
CAV2 RG316-25
C11 1nFCH
C12 100pFHQ
ST4 STRIP LINE 50 OHM
ST3 STRIP LINE 20 OHM
L1 L46RVR1
Q1 BLF244
ST2 STRIP LINE 20 OHM
ST1 STRIP LINE 50 OHM
C7 4n7
C6 1nFCH
C8 4n7
C9 100nF
C10 47uF 25V
R11 18# L2 VK200
R9 100#
R10 100#
R5 100 1%
R4 100 1%
C3 1nF
C4 4n7
C5 47uF 25V
R6 10K 1%
R7 1K 1%
R8 100 1%
D1 1N4148
D2 1N4148
D3 1N4148
D4 1N4148
D5 1N4148
R1 3.3#
R2 3.3#
R3 3.3#
C2 470pF
C1 470pF
CAV1 RG316-25
CN1 BNC TELAID
INPUT
+VCCO
D6 1N4148
TEMP. SENSOR
TO ALARMS CARD

Item	Quantity	Reference	Part	Description	Part Order Code
1	3	R1,R2,R3	3.3#	RESISTOR 2W	RSC002JH03,3
2	1	R11	18#	RESISTOR 2W	RSC002JH0018
3	3	R4,R5,R8	100 1%	RESISTOR 1/4W 1%	RSM1/4FH0100
4	2	R9,R10	100#	RESISTOR 2W	RSC002JH0100
5	1	R7	1K 1%	RESISTOR 1/4W 1%	RSM1/4FK0001
6	1	R6	10K 1%	RESISTOR 1/4W 1%	RSM1/4FK0010
7	1	C12	100pFHQ	HIGHT Q CAPACITOR	CHQ101AJ500
8	2	C1,C2	470pF	CERAMIC CAPACITOR	CKM471BK600P
9	1	C3	1nF	CERAMIC CAPACITOR	CKM102BK600P
10	2	C6,C11	1nFCH	CERAMIC CHIP CAPACITOR	CCC102AJ500
11	3	C4,C7,C8	4n7	CERAMIC CAPACITOR	CKM472BK600P
12	1	C9	100nF	CERAMIC CAPACITOR	CKM104BK600P
13	2	C5,C10	47μF	ELECTROLYTIC CAPACITOR	CEA476BM630
14	1	L2	VK200	RF CHOKE	IMPVK200
15	1	L1	L46RVR1	4S D6 RAME ARG. 1 mm	BFS10000406
16	2	CAV1,CAV2	RG316-25	CAOX CABLE RG316 25 Ohm	CAVRG31625
17	1	CN1	BNC TELAIO	CONN. BNC A TELAIO	CNTBNCFPV
18	6	D1,D2,D3, D4,D5,D6	1N4148	SILICON DIODE	DIS1N4148
19	1	Q1	BLF244	VHF MOS TRANSISTOR	TRNBLF244
20	4	ST1,ST2, ST3,ST4	STRIP LINE	STRIP LINE	



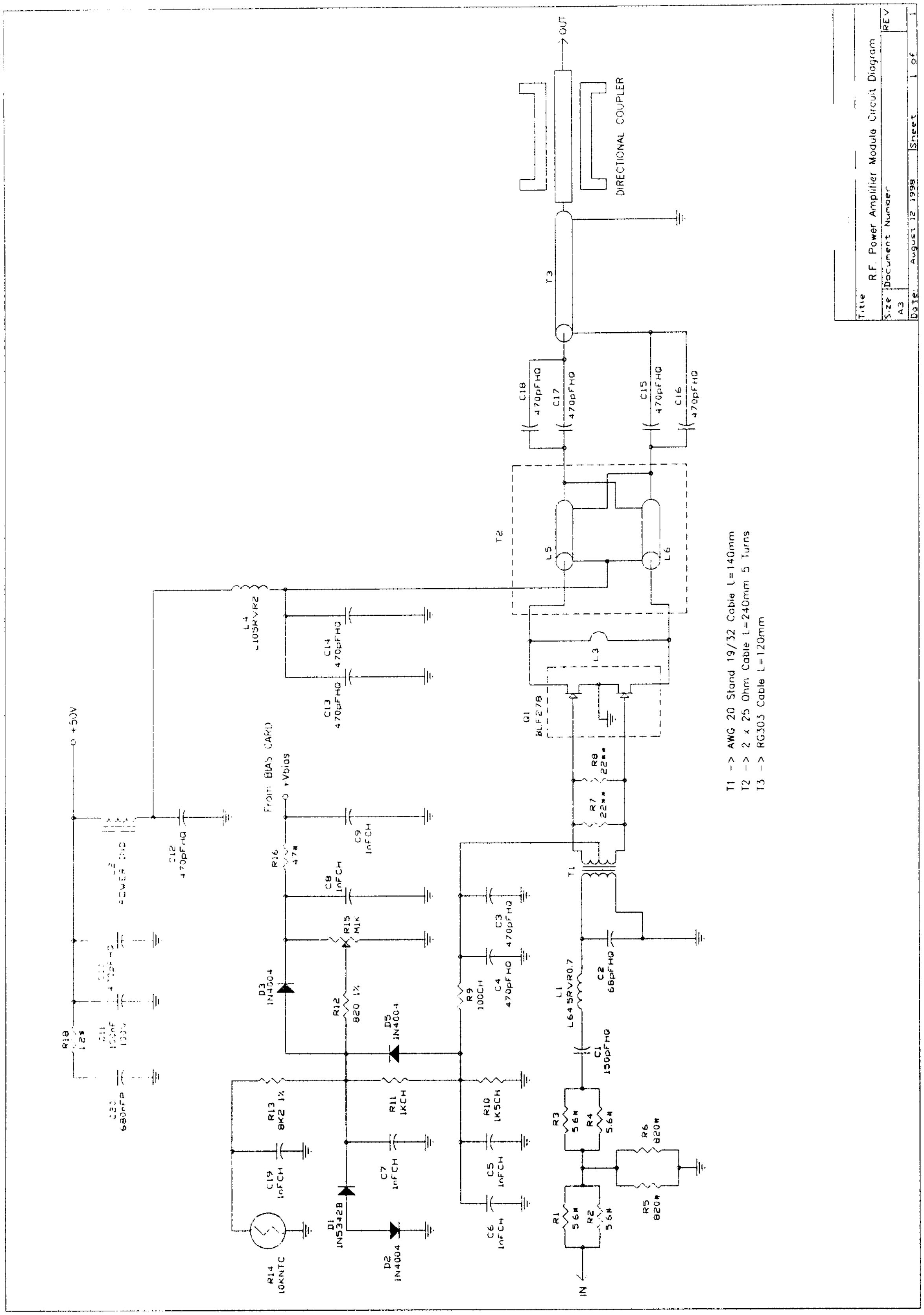
	DENOMINAZIONE RF Power Amplifier – Driver Section – Component Layout	
	DISPOSITIVO	
SEMILAVORATO	DISEGNATO D'Alessio D. il 19/01/99	DISEGNO
MATERIALE	SCALA	
TRATTAMENTO		TAVOLA n di

R.F. POWER AMPLIFIER - FINAL STAGE -

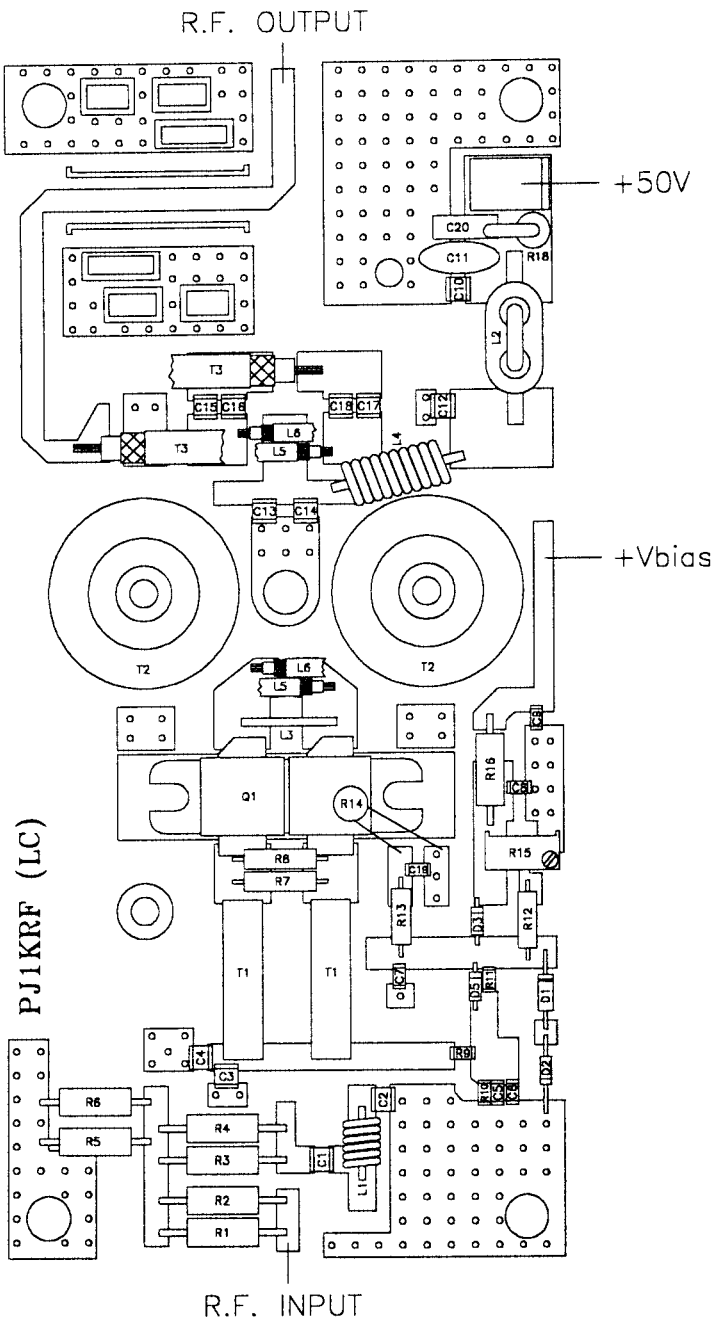
A) Circuit Diagram

B) Bill of Materials

C) Component Layout


Title
R.F. Power Amplifier Module Circuit Diagram
Size
A3
Document Number
REV
Date
August 12 1998
Sheet
1 of 1
DIRECTIONAL COUPLER
OUT
IN
+50V
From BIAS CARD
+Vbias
T1 -> AWG 20 Stand 19/32 Cable L=140mm
T2 -> 2 x 25 Ohm Cable L=240mm 5 Turns
T3 -> RG303 Cable L=120mm
Q1 BLF278
T1
T2
T3
L3
L5
L6
L4 L105RVR2
L1 L645RVR0.7
C1 150pFHQ
C2 68pFHQ
C3 470pFHQ
C4 470pFHQ
C5 1nFCH
C6 1nFCH
C7 1nFCH
C8 1nFCH
C9 1nFCH
C12 470pFHQ
C13 470pFHQ
C14 470pFHQ
C15 470pFHQ
C16 470pFHQ
C17 470pFHQ
C18 470pFHQ
C19 1nFCH
R1 56*
R2 56*
R3 56*
R4 56*
R5 820*
R6 820*
R7 22**
R8 22**
R9 100CH
R10 1K5CH
R11 1KCH
R12 820 1%
R13 8K2 1%
R14 10KNTC
R15 M1k
R16 47*
R18
D1 1N5342B
D2 1N4004
D3 1N4004
D5 1N4004

Item	Quantity	Reference	Part	Description	Part Order Code
1	1	R18	1.2$	RESISTOR 5W	RAF005JH01,2
2	4	R1,R2,R3,R4	5.6#	RESISTOR 2W	RSC002JH05,6
3	2	R7,R8	22**	RESISTOR 1W 5%	RSC001JH0022
4	1	R16	47#	RESISTOR 2W	RSC002JH0047
5	1	R9	100CH	CHIP RESISTOR	RCC1/4JH0100
6	1	R12	820 1%	RESISTOR 1/4W 1%	RSM1/4FH0820
7	2	R5,R6	820#	RESISTOR 2W	RSC002JH0820
8	1	R11	1KCH	CHIP RESISTOR	RCC1/4JH0001
9	1	R10	1K5CH	CHIP RESISTOR	RCC1/4JH01,5
10	1	R13	8K2 1%	RESISTOR 1/4W 1%	RSM1/4FK08,2
11	1	R14	10KNTC	NTC	RNTCPAKK0010
12	1	R15	M1K	TRIMMER MULTIGIRI	RVTMULAK0001
13	1	C2	68pFHQ	HIGHT Q CAPACITOR	CHQ680AJ500
14	1	C1	150pFHQ	HIGHT Q CAPACITOR	CHQ151AJ500
15	10	C3,C4,C10, C12,C13,C14, C15,C16,C17,C18	470pFHQ	HIGHT Q CAPACITOR	CHQ471AJ500
16	6	C5,C6,C7, C8,C9,C19	1nFCH	CERAMIC CHIP CAPACITOR	CCC102AJ500
17	1	C11	100nF	CERAMIC CAPACITOR	CKM104BK600P
18	1	C20	680nFP	POLIESTER CAPACITOR	CPE684DK101
19	1	L2	POWER IND.	RF BINOC. CHOCKE	
20	1	L1	L64.5RVR0.7	6 SP D4.5 R.S. 0.7mm	BFS070064.5
21	1	L4	L105RVR2	10 SP D5 F 2mm	BFS20001005
22	1	L3	BU6012RVR2	B. U L60mm D12 F.A. 2mm	
23	1	T1	4:1	TRASF. RF. CAVO 25 OHM	CAV7612/78
24	1	T3	RG303	COAX CABLE RG303	CAVRG303V
25	2	L5,L6	RG316-25	CAOX CAB. RG316 25 Ohm	CAVRG31625
26	3	D2,D3,D5	1N4004	SILICON DIODE 400V	DIS1N4004
27	1	D1	1N5342B	SILICON DIODE	DIS1N5342B
28	1	Q1	BLF278	VHF PUSH-PULL PWR MOS	TRNBLF278



	DENOMINAZIONE: R.F. Power Amplifier Module Component Layout – Piano di Montaggio
	DISPOSITIVO

SEMILAVORATO	DISEGNATO D'Alessio D. 12/08/98	DISEGNO
MATERIALE	SCALA	
TRATTAMENTO		TAVOLA n di

VCO CARD

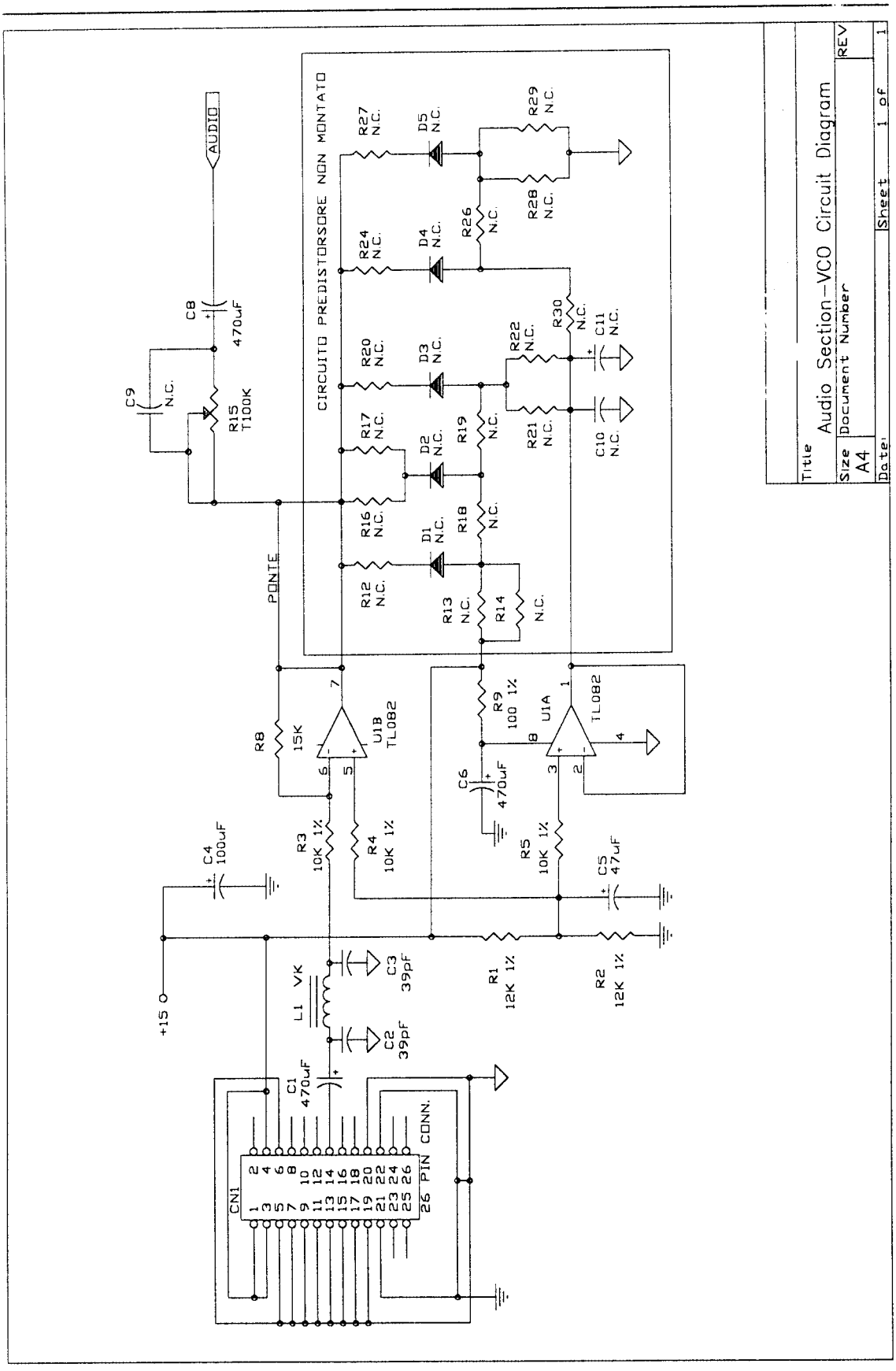
A) Audio Input Circuit Diagram

B) Audio Input Bill of Materials

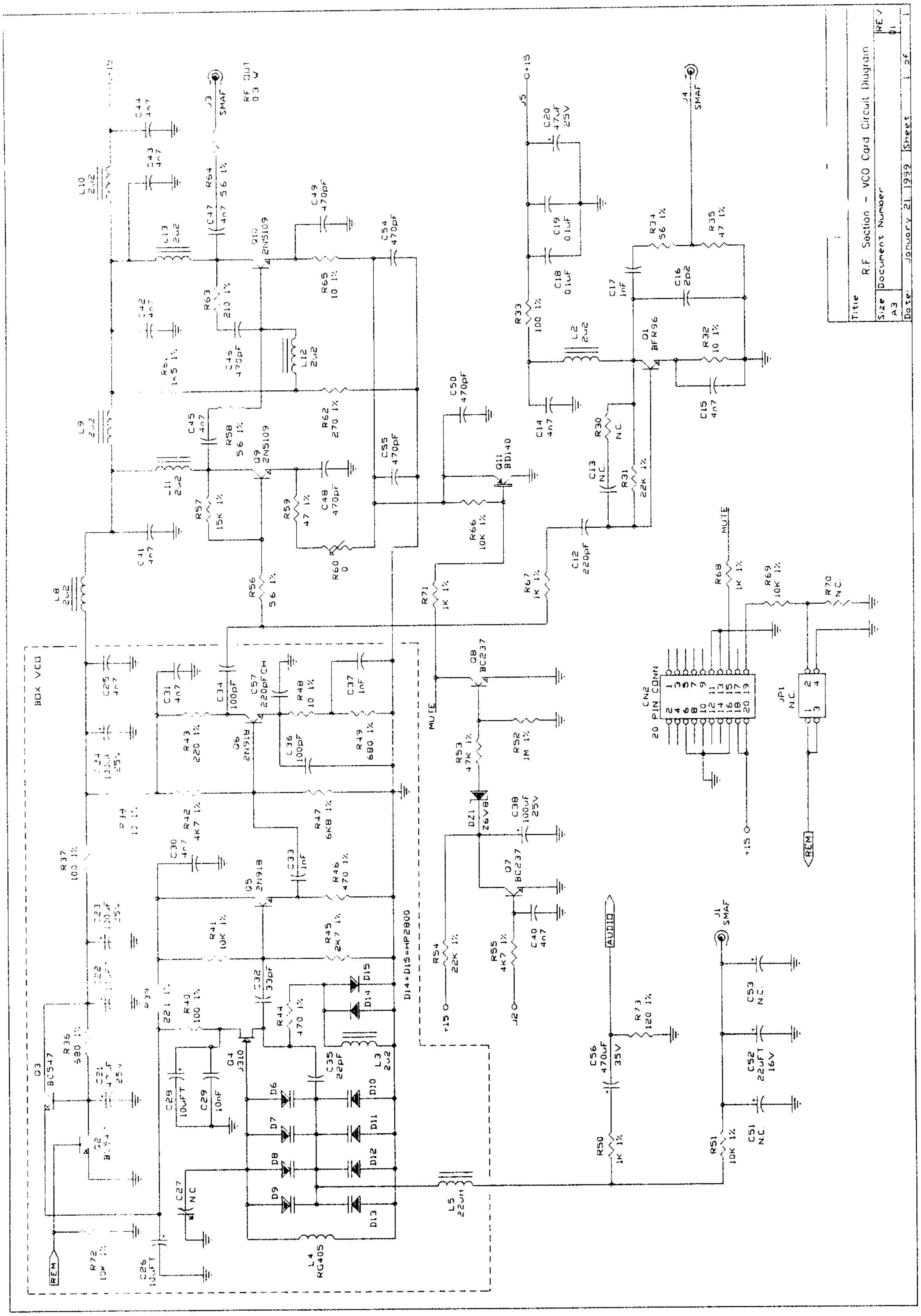
C) R.F. Power Section Circuit Diagram

D) R.F. Power Section Bill of Materials

E) VCO Component Layout


Audio Section-VCO Circuit Diagram
Title
Size A4
Document Number
REV
Date:
Sheet 1 of 1
CIRCUITO PREDISTORSORE NON MONTATO
AUDIO
PONTE
+15
CN1
26 PIN CONN.
C1 470uF
C2 39pF
C3 39pF
C4 100uF
C5 47uF
C6 470uF
C8 470uF
C9 N.C.
C10 N.C.
C11 N.C.
L1 VK
R1 12K 1%
R2 12K 1%
R3 10K 1%
R4 10K 1%
R5 10K 1%
R8 15K
R9 100 1%
R10 N.C.
R11 N.C.
R12 N.C.
R13 N.C.
R14 N.C.
R15 T100K
R16 N.C.
R17 N.C.
R18 N.C.
R19 N.C.
R20 N.C.
R21 N.C.
R22 N.C.
R24 N.C.
R26 N.C.
R27 N.C.
R28 N.C.
R29 N.C.
R30 N.C.
D1 N.C.
D2 N.C.
D3 N.C.
D4 N.C.
D5 N.C.
U1A TL082
U1B TL082

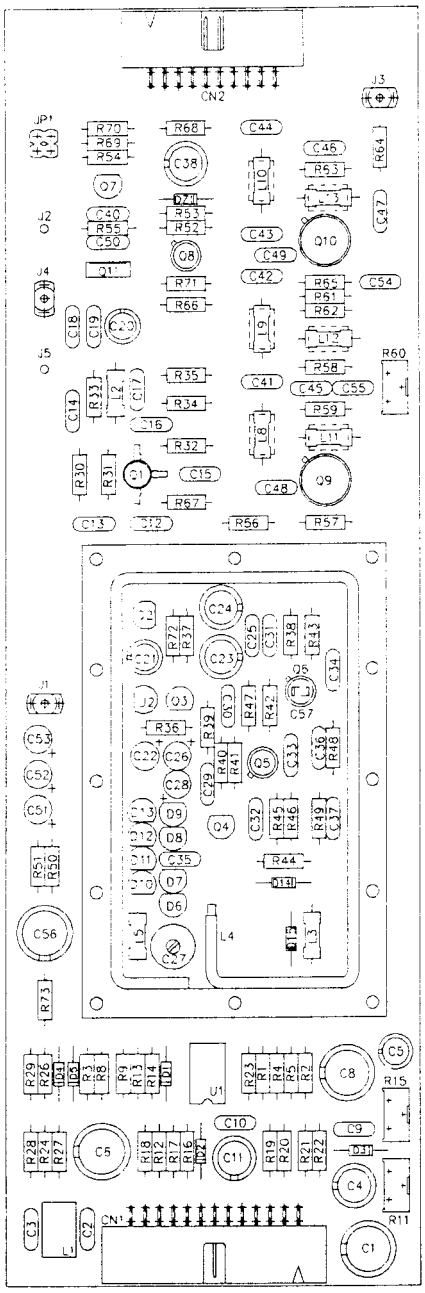
Item	Quantity	Reference	Part	Description	Part Order Code
1	1	R9	100 1%	RESISTOR 1/4W 1%	RSM1/4FH0100
2	3	R3,R4,R5	10K 1%	RESISTOR 1/4W 1%	RSM1/4FK0010
3	2	R1,R2	12K 1%	RESISTOR 1/4W 1%	RSM1/4FK0012
4	1	R8	15K	RESISTOR 1/4W 5%	RSC1/4JK0015
5	1	R15	T100K	TRIMM.REG.VERT. 10mm	RVTD10VK0100
6	2	C2,C3	39pF	CERAMIC CAPACITOR NP0	CKM390BJ600C
7	1	C5	47uF	ELECTROLYTIC CAPACITOR	CEA476BM630
8	1	C4	100uF	ELECTROLYTIC CAPACITOR	CEA107BM350
9	3	C1,C6,C8	470uF	ELECTROLYTIC CAPACITOR	CEA477BM350
10	1	L1	VK	RF CHOKE	IMPVK00A
11	1	CN1	26 P CONN.	CONN. M 2*13 P 2.54	CNTMCSFC26P
12	1	U1	TL082	DOUBLE OP. AMP.	CILTL082
13	24	D1,D2,D3, D4,D5,C9, C10,C11,R12, R13,R14,R16, R17,R18,R19, R20,R21,R22, R24,R26,R27, R28,R29,R30	N.C.	NOT CONNECTED	


Title
R.F. Section - VCO Card Circuit Diagram
Size
A3
Document Number
REV
Date: January 21 1999
Sheet

Item	Quantity	Reference	Part	Description	Part Order Code
1	1	R60	0	0 OHM RESISTOR	R000
2	3	R56,R58,R64	5.6 1%	RESISTOR 1/4W 1%	RSM1/4FH05,6
3	4	R32,R38, R48,R65	10 1%	RESISTOR 1/4W 1%	RSM1/4FH0010
4	1	R39	22.1 1%	RESISTOR 1/4W 1%	RSM1/4FH22,1
5	2	R35,R59	47 1%	RESISTOR 1/4W 1%	RSM1/4FH0047
6	1	R34	56 1%	RESISTOR 1/4W 1%	RSM1/4FH0056
7	3	R33,R37,R40	100 1%	RESISTOR 1/4W 1%	RSM1/4FH0100
8	1	R73	120 1%	RESISTOR 1/4W 1%	RSM1/4FH0120
9	1	R63	210 1%	RESISTOR 1/4W 1%	RSM1/4FH0210
10	1	R43	220 1%	RESISTOR 1/4W 1%	RSM1/4FH0220
11	1	R62	270 1%	RESISTOR 1/4W 1%	RSM1/4FH0270
12	2	R44,R46	470 1%	RESISTOR 1/4W 1%	RSM1/4FH0470
13	2	R36,R49	680 1%	RESISTOR 1/4W 1%	RSM1/4FH0680
14	4	R50,R67,	1K 1%	RESISTOR 1/4W 1%	RSM1/4FK0001
15	1	R61	1K5 1%	RESISTOR 1/4W 1%	RSC1/4FK01,5
16	1	R45	2K7 1%	RESISTOR 1/4W 1%	RSM1/4FK02,7
17	2	R42,R55	4K7 1%	RESISTOR 1/4W 1%	RSM1/4FK04,7
18	1	R47	6K8 1%	RESISTOR 1/4W 1%	RSM1/4FK06,8
19	5	R41,R51, R66,R69,R72	10K 1%	RESISTOR 1/4W 1%	RSM1/4FK0010
20	1	R57	15K 1%	RESISTOR 1/4W 1%	RSC1/4FK0015
21	2	R31,R54	22K 1%	RESISTOR 1/4W 1%	RSM1/4FK0022
22	1	R53	47K 1%	RESISTOR 1/4W 1%	RSM1/4FK0047
23	1	R52	1M 1%	RESISTOR 1/4W 1%	RSM1/4FM0001
24	1	C16	2p2	CERAMIC CAPACITOR NP0	CKM2,2BJ600C
25	1	C35	22pF	CERAMIC CAPACITOR NP0	CKM220BJ600C
26	1	C32	33pF	CERAMIC CAPACITOR NP0	CKM330BJ600C
27	2	C34,C36	100pF	CERAMIC CAPACITOR NP0	CKM101BJ600C
28	1	C12	220pF	CERAMIC CAPACITOR NP0	CKM221BK600C

Item	Quantity	Reference	Part	Description	Part Order Code
29	1	C57	220pFCH	CERAMIC CHIP CAPACITOR	CCC221AJ500
30	6	C46,C48, C49,C50, C54,C55	470pF	CERAMIC CAPACITOR	CKM471BK600P
31	3	C17,C33,C37	1nF	CERAMIC CAPACITOR	CKM102BK600P
32	12	C14,C15, C25,C30,C31, C40,C41,C42, C43,C44,C45, C47	4n7	CERAMIC CAPACITOR	CKM472BK600P
33	1	C29	10nF	CERAMIC CAPACITOR	CKM103BK600P
34	2	C18,C19	0.1µF	CERAMIC CAPACITOR	CKM104BK600P
35	3	C22,C26,C28	10µFT	TANTALIUM CAPACITOR	CET106AM350
36	1	C52	22µFT	TANTALIUM CAPACITOR	CET226AM350
37	2	C20,C21	47µF	ELECTROLYTIC CAPACITOR	CEA476BM630
38	3	C23,C24,C38	100µF	ELECTROLYTIC CAPACITOR	CEA107BM350
39	1	C56	470µF	ELECTROLYTIC CAPACITOR	CEA477BM350
40	8	L2,L3,L8, L9,L10,L11, L12,L13	2µ2	RF CHOKE	IMP02U2A
41	1	L5	22µH	RF CHOKE	IMP22U0A
42	1	CN2	20P CONN.	CONN. M 2*10 P 2.54	CNTMCSFC20P
43	1	L4	RG405	COAX CABLE RG405	CAVRG405
44	3	J1,J3,J4	SMAF	CONN. SMA F TELAIO	CNTSMAF
45	2	D14,D15	HP2800	HOT CARRIER DIODE	DHCBA481
46	8	D6,D7,D8, D9,D10,D11, D12,D13	MV209	VARICAP DIODE	DIVMV209
47	1	DZ1	Z6V8	ZENER DIODE 6.8V 0.4W	DIZ6V80W4
48	2	Q7,Q8	BC237	NPN TRANSISTOR	TRNBC237
49	2	Q2,Q3	BC547	NPN TRANSISTOR	TRNBC547
50	1	Q11	BD140	PNP TRANSISTOR	TRNBD140
51	2	Q5,Q6	2N918	NPN RF TRANSISTOR	TRN2N918
52	2	Q9,Q10	2N5109	NPN RF TRANSISTOR	TRN2N5109

Item	Quantity	Reference	Part	Description	Part Order Code
53	1	Q1	BFR96	NPN RF TRANSISTOR	TRNBFR96
54	1	Q4	J310	FET TRANSISTOR	TRNJ310
55	7	JP1,C13, C27,R30, C51,C53,R70	N.C.	NOT CONNECTED	



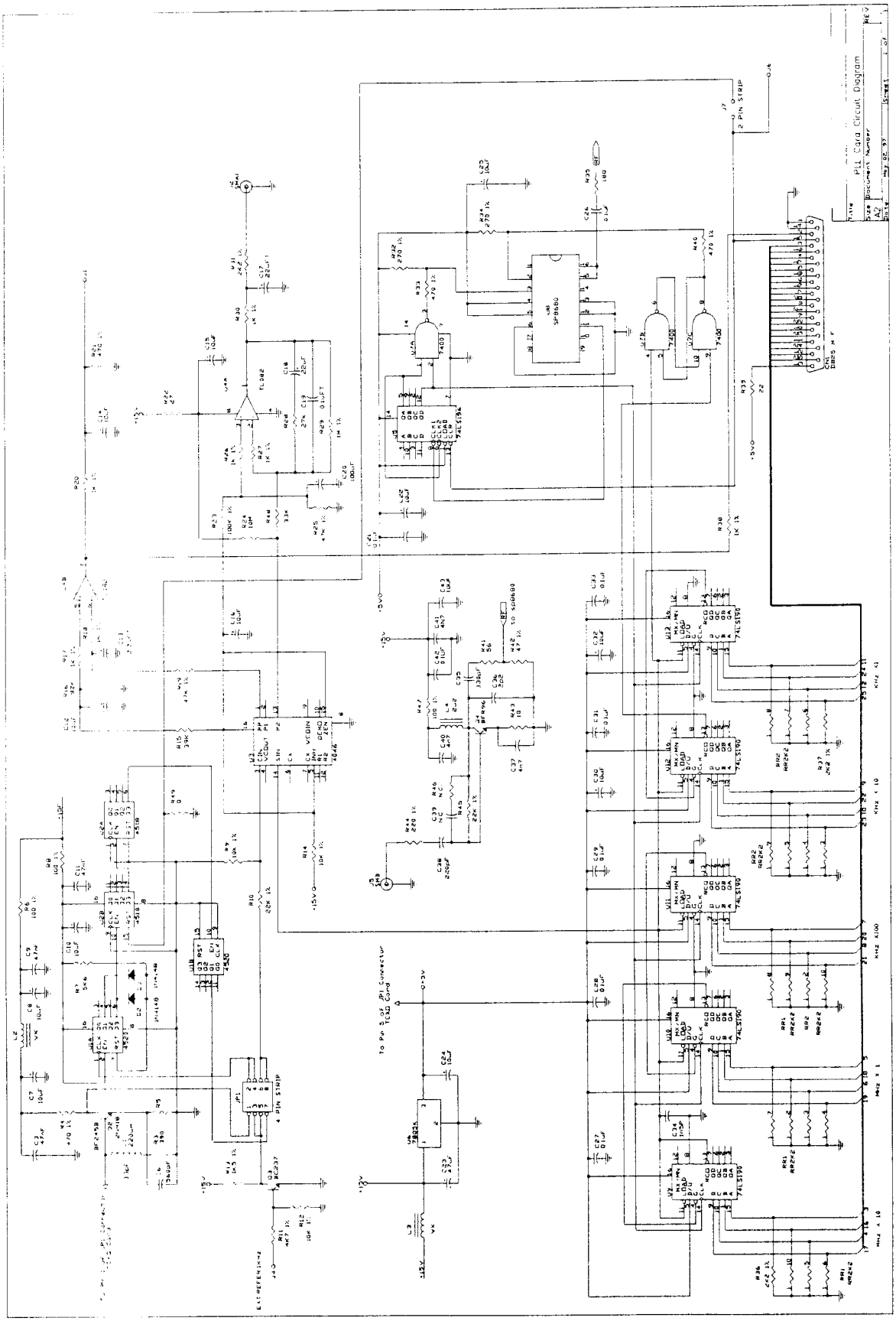
	DENOMINAZIONE VCO Card Component Layout / Piano di Montaggio
	DISPOSITIVO
SEMILAVORATO	DISEGNATO D'Alessio D. ti
MATERIALE	SCALA
TRATTAMENTO	DISEGNO TAVOLA n 1 di 1

PLL CARD

A) Circuit Diagram

B) Bill of Materials

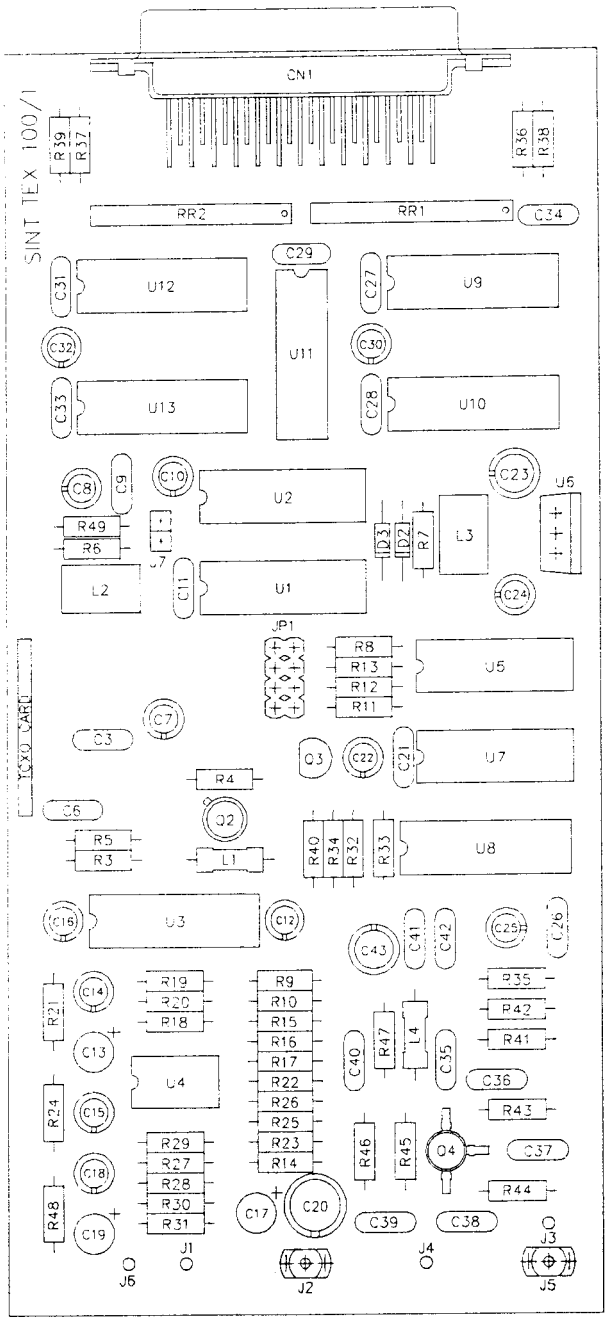
C) Component Layout



Item	Quantity	Reference	Part	Description	Part Order Code
1	1	R49	0	0 OHM RESISTOR	R000
2	1	R43	10 1%	RESISTOR 1/4W 1%	RSM1/4FH0010
3	1	R39	22 1%	RESISTOR 1/4W 1%	RSM1/4FH0022
4	1	R22	27 1%	RESISTOR 1/4W 1%	RSM1/4FH0027
5	1	R42	47 1%	RESISTOR 1/4W 1%	RSM1/4FH0047
6	1	R41	56 1%	RESISTOR 1/4W 1%	RSM1/4FH0056
7	4	R5,R6,R8, R47	100 1%	RESISTOR 1/4W 1%	RSM1/4FH0100
8	1	R35	180	RESISTOR 1/4W 5%	RSC1/4JH0180
9	1	R44	220 1%	RESISTOR 1/4W 1%	RSM1/4FH0220
10	2	R32,R34	270 1%	RESISTOR 1/4W 1%	RSM1/4FH0270
11	1	R3	390 1%	RESISTOR 1/4W 1%	RSM1/4FH0390
12	4	R4,R21,R33, R40	470 1%	RESISTOR 1/4W 1%	RSM1/4FH0470
13	7	R17,R18, R20,R26,R27, R30,R38	1K 1%	RESISTOR 1/4W 1%	RSM1/4FK0001
14	3	R13,R36,R37	1K5 1%	RESISTOR 1/4W 1%	RSC1/4FK01,5
15	1	R31	2K2 1%	RESISTOR 1/4W 1%	RSC1/4FK02,2
16	1	R11	4K7 1%	RESISTOR 1/4W 1%	RSM1/4FK04,7
17	1	R7	5K6 1%	RESISTOR 1/4W 1%	RSM1/4FK05,6
18	3	R9,R12,R14	10K 1%	RESISTOR 1/4W 1%	RSM1/4FK0010
19	2	R10,R45	22K 1%	RESISTOR 1/4W 1%	RSM1/4FK0022
20	1	R28	27K 1%	RESISTOR 1/4W 1%	RSM1/4FK0027
21	1	R48	33K 1%	RESISTOR 1/4W 1%	RSM1/4FK0033
22	1	R15	39K 1%	RESISTOR 1/4W 1%	RSM1/4FK0039
23	2	R19,R25	47K 1%	RESISTOR 1/4W 1%	RSM1/4FK0047
24	1	R16	82K 1%	RESISTOR 1/4W 1%	RSM1/4FK0082
25	1	R23	100K 1%	RESISTOR 1/4W 1%	RSM1/4FH0100
26	1	R29	1M 1%	RESISTOR 1/4W 1%	RSM1/4FM0001
27	1	R24	10M 1%	RESISTOR 1/4W 1%	RSM1/4FM0010

Item	Quantity	Reference	Part	Description	Part Order Code
28	2	RR1,RR2	RR2K2	RESISTOR NETWORK	RRR1/4JK02,2
29	1	C36	2p2	CERAMIC CAPACITOR NP0	CKM2,2BJ600C
30	1	C38	220pF	CERAMIC CAPACITOR NP0	CKM221BK600C
31	1	C35	330pF	CERAMIC CAPACITOR	CKM331BK600P
32	1	C6	560pF	CERAMIC CAPACITOR	CKM561BK600P
33	1	C34	1n5P	POLIESTER CAPACITOR	CPE152BK101
34	3	C37,C40,C41	4n7	CERAMIC CAPACITOR	CKM472BK600P
35	3	C3,C9,C11	47nF	CERAMIC CAPACITOR	CKM473BK600P
36	8	C21,C26, C27,C28,C29, C31,C33,C42	0.1µF	CERAMIC CAPACITOR	CKM104BK600P
37	1	C19	0.1µFT	TANTALIUM CAPACITOR	CET104AM350
38	1	C13	2.2µFT	TANTALIUM CAPACITOR	CET225AM350
39	13	C7,C8,C10, C12,C14,C15, C16,C22,C24, C25,C30,C32, C43	10µF	ELECTROLYTIC CAPACITOR	CEA106AM350
40	1	C18	22µF	ELECTROLYTIC CAPACITOR	CEA226BM350
41	1	C17	22µFT	TANTALIUM CAPACITOR	CET226AM350
42	1	C23	47µF	ELECTROLYTIC CAPACITOR	CEA476BM630
43	1	C20	100µF	ELECTROLYTIC CAPACITOR	CEA107BM350
44	1	L4	2µ2	RF CHOKE	IMP02U2A
45	1	L1	220µH	RF CHOKE	IMP220UA
46	2	L2,L3	VK	RF CHOKE	IMPVK00A
47	1	J7	2 PIN STRIP	STRIP M P 2.54 2 PIN	CNTSTRIPMCS
48	1	JP1	4 PIN STRIP	STRIP M P 2.54 4 PIN	CNTSTRIPMCS
49	1	J1	2 PIN JUMP	MINIJUMPER P 2.54	MINIJUMPER
50	1	CN1	DB25 M F	CONN. M 25 FILT. MURATA	
51	2	J2,J5	SMB	CONN. SMB CRIMP. RG188	CNTSMBFCVD
52	2	D2,D3	1N4148	SILICON DIODE	DIS1N4148
53	1	U6	7805	POS. STABILIZER 1A	CIL7805P

Item	Quantity	Reference	Part	Description	Part Order Code
54	1	Q3	BC547	NPN TRANSISTOR	TRNBC547
55	1	Q2	2N918	NPN RF TRANSISTOR	TRN2N918
56	1	Q4	BFR96	NPN RF TRANSISTOR	TRNBFR96
57	1	U4	TL082	DOUBLE OP. AMP.	CILTL082
58	1	U8	SP8680	ECL DIVIDER	CIDSP8680B
59	1	U3	4046	CMOS PHASE COMPARATOR	CID4046
60	1	U2	4518	CMOS BCD DIVIDER	CID4518
61	1	U1	4520	CMOS BIN DIVIDER	CID4520
62	1	U7	7400	TTL QUAD NAND	CID7400
63	5	U9,U10,U11, U12,U13	74LS190	TTL BCD DIVIDER	CID74LS190
64	1	U5	74LS196	TTL LS DIVIDER	CID74LS196
65	2	C39,R46	N.C.	NOT CONNECTED	



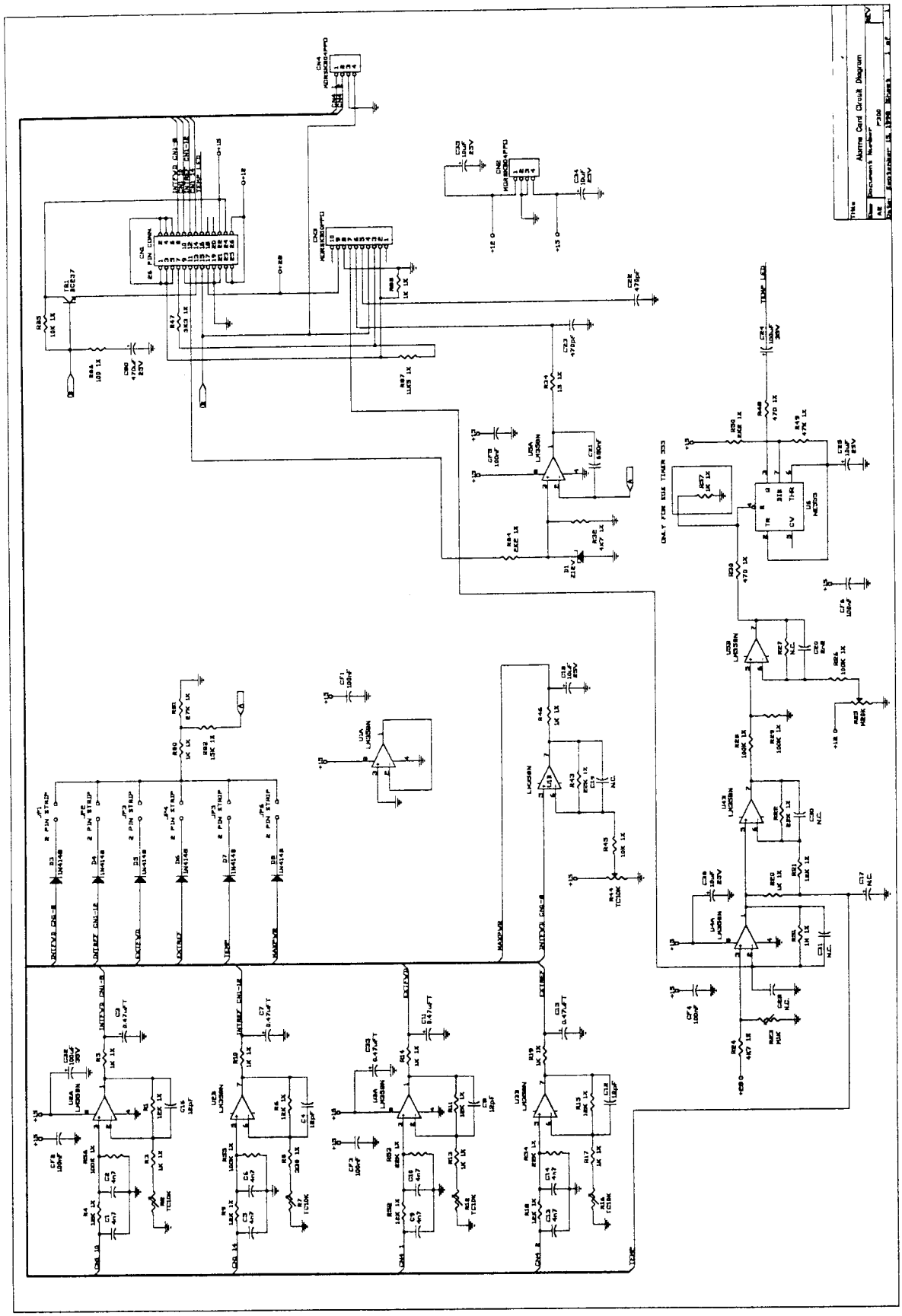
DENOMINAZIONE	PLL Card Component Layout / Piano di Montaggio
DISPOSITIVO	TEX100 (F.M. Exciter)
SEMILAVORATO	
MATERIALE	
TRATTAMENTO	
DISEGNATO	D'Alessio D. ti
SCALA	
DISEGNO	
TAVOLA n. 1 di 1	

ALARMS CARD

A) Circuit Diagram

B) Bill of Materials

C) Component Layout



Item	Quantity	Reference	Part	Description	Part Order Code
1	1	R34	15 1%	RESISTOR 1/4W 1%	RSM1/4JH0015
2	1	R86	100 1%	RESISTOR 1/4W 1%	RSM1/4FH0100
3	1	R8	330 1%	RESISTOR 1/4W 5%	RSM1/4FH0330
4	2	R30,R48	470 1%	RESISTOR 1/4W 1%	RSM1/4FH0470
5	12	R3,R5,R10, R13,R14,R17, R19,R20,R46, R57,R80,R88	1K 1%	RESISTOR 1/4W 1%	RSM1/4FK0001
6	2	R50,R84	2K2 1%	RESISTOR 1/4W 1%	RSC1/4FK02,2
7	1	R47	3K3 1%	RESISTOR 1/4W 1%	RSM1/4FK03,3
8	2	R24,R32	4K7 1%	RESISTOR 1/4W 1%	RSM1/4FK04,7
9	2	R45,R85	10K 1%	RESISTOR 1/4W 1%	RSM1/4FK0010
10	1	R87	11K5 1%	RESISTOR 1/4W 1%	RSM1/4FK11,5
11	9	R1,R4,R6, R9,R11,R15, R18,R21,R52	12K 1%	RESISTOR 1/4W 1%	RSM1/4FK0012
12	1	R82	15K 1%	RESISTOR 1/4W 1%	RSC1/4FK0015
13	4	R22,R43, R53,R54	22K 1%	RESISTOR 1/4W 1%	RSM1/4FK0022
14	1	R81	27K 1%	RESISTOR 1/4W 1%	RSM1/4FK0027
15	1	R49	47K 1%	RESISTOR 1/4W 1%	RSM1/4FK0047
16	5	R26,R28, R29,R55,R56	100K 1%	RESISTOR 1/4W 1%	RSM1/4FH0100
17	1	R51	1M 1%	RESISTOR 1/4W 1%	RSM1/4FM0001
18	5	R2,R7,R12, R16,R44	TC10K	TRIM. REG. VERT. CERMET	RVTCERVK0010
19	1	R23	M1K	TRIMMER MULTIGIRI	RVTMULAK0001
20	1	R25	M20K	TRIMMER MULTIGIRI	RVTMULAK0020
21	4	C4,C8,C12, C16	12pF	CERAMIC CAPACITOR NP0	CKM120BJ600C
22	2	C22,C23	470pF	CERAMIC CAPACITOR	CKM471BK600P
23	1	C20	2n2	CERAMIC CAPACITOR	CKM222BK600P
24	8	C1,C2,C5, C6,C9,C10, C13,C14	4n7	CERAMIC CAPACITOR	CKM472BK600P