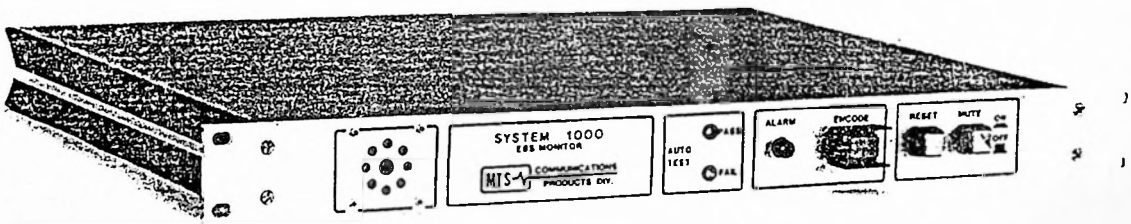
MTS COMMUNICATIONS PRODUCTS DIV.



EQUIPMENT MANUAL: SYSTEM 1000

P/N: 2017-990

MULTI-TECHNICAL SERVICES

150 CLAYTON COMMERCE CENTER

CLAYTON, NC 27520

(919) 553-2995

A WORD OF THANKS TO OUR VALUED CUSTOMERS....

THE STAFF AT MULTI-TECHNICAL SERVICES (MTS) WISHES TO THANK YOU, OUR CUSTOMER, FOR PURCHASING ONE OF THE FINEST EMERGENCY BROADCAST SYSTEM MONITORS AVAILABLE TO SERVE YOUR COMMUNITY.

WARRANTY AND LIMITATION OF LIABILITY

MTS WARRANTS FOR EQUIPMENT SOLD HEREUNTO THAT FOR A PERIOD OF 6 MONTHS FROM MTS'S SHIPMENT DATE THAT EQUIPMENT SHALL BE FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP AND CONFORM TO THE EQUIPMENTS' SPECIFICATIONS.

IF A DEFECT OCCURS WITHIN THE WARRANTY PERIOD, BUYER SHALL IMMEDIATELY NOTIFY MTS AND MTS SHALL REPAIR OR REPLACE DEFECTIVE EQUIPMENT WITHOUT EXTRA CHARGE.

THIS WARRANTY DOES NOT APPLY TO DEFECTS NOT CAUSED BY MTS (FOR EXAMPLE: LIGHTNING DAMAGE, ACCIDENTS OR ABUSE, WORK OR INSTALLATION DONE IMPROPERLY OR CONTRARY TO MTS STANDARDS) OR TO EQUIPMENT ON WHICH THE MODEL OR SERIAL NUMBERS, MANUFACTURE OR SHIPMENT DATES ARE CHANGED OR REMOVED, OR WARRANTY SEALS BROKEN.

NO OTHER WARRANTY, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY.

WHETHER OR NOT CAUSED BY MTS'S NEGLIGENCE, MTS SHALL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL OR OTHER DAMAGES, HOWEVER CAUSED (INCLUDING LATE DELIVERY). MTS'S OBLIGATION TO REPAIR OR REPLACE EQUIPMENT IN ACCORDANCE WITH THE ABOVE WARRANTY SHALL BE BUYER'S EXCLUSIVE REMEDY FOR BREACH OF ANY WARRANTY OR FROM NEGLIGENCE. IF MTS FAILS TO REPAIR OR REPLACE AS AFORESAID, MTS'S ENTIRE LIABILITY TO BUYER SHALL NOT EXCEED THE REPAIR OR REPLACEMENT VALUE, WHICHEVER IS LOWER, OF THE DEFECTIVE ITEM.

SECTION 1

EQUIPMENT SUPPLIED

THE STANDARD SYSTEM 1000 CONSISTS OF THE FOLLOWING ITEMS:
1 SYSTEM 1000 MAIN UNIT WITH AN AM OR FM BROADCAST RECEIVER INSTALLED TUNED TO YOUR SPECIFIED CPCS1. P/N 2017-000.

1 POWER SUPPLY TRANSFORMER ASSEMBLY P/N 2017-956

1 MANUAL P/N 2017-990

1 ACCESSORY KIT P/N 2017-957

OPTIONAL ACCESSORIES

TERMINAL BLOCK OPTION KIT

A DB-25 TO TERMINAL BLOCK OPTION ASSEMBLY IS AVAILABLE FOR YOUR SYSTEM 1000. ORDER P/N 2017-951.

FM ANTENNA KIT

FM RECEIVING ANTENNA AND FEED LINE KIT. ORDER P/N 1085-964. SPECIFY FEED LINE LENGTH.

AM ANTENNA KIT

AM RECEIVING ANTENNA AND FEED LINE KIT. ORDER P/N 1085-967. SPECIFY FEED LINE LENGTH.

MODULE SPARES KITS ARE ALSO AVAILABLE. SEE SECTION 14 OF THIS MANUAL.

ENCODE ONLY LOOP THRU

THE ENCODE ONLY LOOP THRU OPTION IS A FACTORY MODIFICATION THAT DISABLES THE LOOP THRU FUNCTION FOR THE DECODE CYCLE.
THIS OPTION IS A NO CHARGE OPTION WHEN ORDERED WITH THE UNIT.
ORDER PART NUMBER 2017-981

UNPACKING THE SYSTEM

CAREFULLY INSPECT THE SHIPPING CARTON FOR EVIDENCE OF SHIPPING DAMAGE BEFORE YOUR CARRIER DEPARTS. IF THE CARTON HAS BEEN DEFORMED, OPEN AT ONCE AND INSPECT THE UNIT, POWER SUPPLY, ACCESSORY KIT, AND MANUAL FOR DAMAGE. IF ANY DAMAGE HAS BEEN SUSTAINED, FILE A CLAIM WITH YOUR CARRIER, IMMEDIATELY. INSPECTING THE EQUIPMENT FOR SHIPPING DAMAGE AND FILING OF SUCH CLAIMS IS THE RESPONSIBILITY OF THE BUYER. SHOULD THE UNIT BE DAMAGED IN SHIPPING, NOTIFY MTS SALES DEPARTMENT SUCH THAT REPAIRS OR REPLACEMENTS CAN BE EXPEDITED.

SECTION TWO: INTRODUCTION TO THE SYSTEM 1000

MEET THE SYSTEM 1000, YOUR NEW EBS MONITOR.

WHAT IS SYSTEM 1000? SYSTEM 1000 IS AN INTEGRATED EBS MONITOR SYSTEM.

SYSTEM 1000 INTEGRATES THE EBS DECODER, THE ENCODER, MONITOR RECEIVER, AND A NUMBER OF ADVANCED FEATURES, INCLUDING AUTOMATIC SELF TESTING, INTO ONE SMALL UNIT THAT OCCUPIES ONLY 1.75 INCHES OF RACK SPACE IN A STANDARD 19 INCH RACK.

WITH ONLY THREE FRONT PANEL CONTROLS THE SYSTEM 1000 IS VERY OPERATOR FRIENDLY. WITH THE REMOTE OPERATION FEATURES AVAILABLE AT THE REAR PANEL, THE SYSTEM CAN BE REMOTELY OPERATED JUST AS EASILY. PROVISIONS HAVE BEEN MADE FOR THE SYSTEM TO INTERFACE WITH JUST ABOUT ANY AUDIO SYSTEM. WHETHER YOUR APPLICATION CALLS FOR SINGLE ENDED AUDIO OUT TO YOUR AUDIO CONSOLE OR STEREO AUTOMATIC PROGRAM AUDIO LOOP THROUGH, OR ANY CONFIGURATION IN BETWEEN, SYSTEM 1000 HAS PROVISIONS FOR IT. INTERFACING THE SYSTEM 1000 WITH YOUR DIGITAL REMOTE CONTROL SYSTEM IS A CINCH BECAUSE ALL OF THE REMOTE CONTROL FEATURES ARE TTL COMPATIBLE, INCLUDING THE AUTO-TEST OUTPUT.

SECTION THREE: EQUIPMENT SPECIFICATIONS

GENERAL SPECIFICATIONS

STORAGE ENVIRONMENT:
- TEMPERATURE- -35 TO +85 DEGREES CELSIUS
- HUMIDITY- 0 TO 90% NON-CONDENSATING

OPERATING ENVIRONMENT:
- TEMPERATURE- 0 TO +50 DEGREES CELSIUS
- HUMIDITY- 0 TO 95% NON-CONDENSATING

ENVIRONMENT TYPE- INDOOR - EXTENDED

PHYSICAL SIZE- 1.75 INCHES HIGH, 19 INCHES WIDE, 13 INCHES DEEP

WEIGHT - 5.8 POUNDS

SHIPPING WEIGHT - 12 POUNDS

POWER INPUT REQUIREMENTS:
- PRIMARY SUPPLY - 115VAC +/- 15% 57-63Hz @ .5 AMPERE
- BACKUP BATTERY - 12.5 VDC +/- .5VDC @ .5 AMPERE

ENCODER SPECIFICATIONS:
- TONE A FREQUENCY - 853Hz +/- 0.25Hz
- TONE B FREQUENCY - 960Hz +/- 0.25Hz
- TONE BALANCE - +/- 0.5 DB ADJUSTABLE
- OUTPUT LEVEL - ADJUSTABLE -25 TO +8 dBm
- OUTPUT TYPE - 600 OHM BALANCED
- DISTORTION - 2% MAX
- DURATION - 22.5 SECONDS +/- 5mSEC
- RESETABLE - YES, AT ANY POINT DURING ALARM MODE.
- ENCODE CONTROLS - FRONT PANEL MOMENTARY SWITCH
  REAR PANEL: ACTIVE LOW TTL LEVEL PULSE DURATION 100mSEC TO 22.5S

DECODER SPECIFICATIONS:
- TONE A WINDOW - 853 +/- 4.5Hz
- TONE B WINDOW - 960 +/- 4.5Hz
- FALSING RATE - 0.000%
- VALIDATION TIME - 8.50 SECONDS +/- 5mSEC.
- AUDIO INPUT LEVEL - 20mV RMS TO 120mV RMS.
- TONE BALANCE RQRMT - 2 dB
- MAX. NOISE CONTENT - 30%
- MUTE CONTROLS - FRONT PANEL LATCHING SWITCH
  REAR PANEL: ACTIVE LOW TTL LEVEL

ALARM OUTPUTS:
- FRONT PANEL ALARM LED
- REAR PANEL DRY CONTACT CLOSURE - 50 VDC 0.5AMP
- REAR PANEL DRY CONTACT OPENING - 50 VDC 0.5AMP
- REAR PANEL ALARM OUT- OPEN COLLECTOR ACTIVE LOW 20V DC MAX 15 mA MAX

RESET INPUTS:
FRONT PANEL MOMENTARY SWITCH
REAR PANEL RESET INPUT - TTL ACTIVE LOW PULSE 100mSEC

MISCELLANOUS SPECIFICATIONS:

MONITOR OUTPUT: (REAR PANEL)

OUTPUT TYPE - SINGLE ENDED AC COUPLED
OUTPUT LEVEL- -20 dBM TO +8 dBM ADJUSTABLE
DISTORTION- 5% MAX

SPEAKER OUTPUT: (FRONT PANEL)
OUTPUT LEVEL - 0 TO 0.2 WATTS RMS INTO 8 OHMS ADJUSTABLE
DISTORTION - 5% MAX.

AUDIO OUTPUT: (REAR PANEL)
OUTPUT TYPE - 600 OHM BALANCED
OUTPUT LEVEL - -20dBM TO +8dBM ADJUSTABLE
DISTORTION - 2% MAX.

AUTO TEST OUTPUT:
FRONT PANEL AT PASS INDICATOR
FRONT PANEL AT FAIL INDICATOR
REAR PANEL AT OUTPUT - OPEN COLLECTOR ACTIVE LOW (FAIL)
20VDC MAX 15mA MAX.

PROGRAM AUDIO LOOP THROUGH:
ACTIVE DURING ANY ALARM ENCODE/DECODE MODE (STEREO):
CHANNEL ISOLATION - IN EXCESS OF 40 dB
INSERTION LOSS - LESS THAN 0.2 dB
SWITCHING TYPE - RELAY CONTACTS (BOTH CHANNELS, BOTH SIDES OF EACH LINE)

****
NOTE: WITHOUT THE ENCODE ONLY PGM LOOP THRU MOD, THE SYSTEM ENABLES THE AUDIO LOOP IN BOTH ENCODE AND DECODE MODES. THIS FEATURE IS INTENDED FOR USE AT AUTOMATED STATIONS. IF YOU DID NOT ORDER THE ENCODE PGM AUDIO LOOP THRU MOD WITH YOUR UNIT AND YOU WISH TO HAVE THE LOOP ACTIVE FOR ONLY THE ENCODE MODE, CONTACT THE SERVICE DEPARTMENT AT 919-553-2995 FOR A COPY OF THE MODIFICATION INSTRUCTIONS, OR AN RMA NUMBER FOR YOUR AUDIO PROCESSOR MODULE OR UNIT TO HAVE THIS MODIFICATION INSTALLED. PART NUMBER 2017-981.
****

ALARM SWITCHED AUDIO PORTS:
OUTPUT TYPES - 600 OHM BALANCED
OUTPUT LEVELS - -20 TO +8dBM ADJUSTABLE
DISTORTION - 2% MAX.

RECEIVER MONITOR PORT:
HIGH IMPEDANCE (100K) 90 mV RMS AUDIO
CAUTION- MUST USE AC COUPLED MONITOR AMPLIFIER

SECTION FOUR: INSTALLATION

1.0 ANTENNA SITE(S)

ANTENNA REQUIREMENTS WILL VARY GREATLY DEPENDING ON A LARGE NUMBER OF FACTORS: YOUR RECEIVING ANTENNA, ANTENNA HEIGHT ABOVE AVERAGE TERRAIN, DISTANCE TO MONITORED STATION, THAT STATIONS' COVERAGE AREA AND EFFECTIVE RADIATED POWER, ETC. SINCE IT IS NOT POSSIBLE TO COVER EVERY SITUATION IN THIS TEXT WE WILL GIVE A FEW GENERAL GUIDELINES.

(A) KEEP THE FEED LINE LENGTH BETWEEN THE ANTENNA AND THE RECEIVER AS SHORT AS POSSIBLE.

(B) USE QUALITY, LOW LOSS FEED LINE.

(C) AVOID "SPLICING" FEED LINES.

(D) MAKE SURE THAT ALL ANTENNA CONNECTIONS ARE WEATHER PROOFED.

(E) LOCATE YOUR ANTENNA AS FAR FROM HIGH ENERGY RF SOURCES AS POSSIBLE.

(F) FOLLOW ANTENNA ASSEMBLY AND INSTALLATION INSTRUCTIONS VERY CAREFULLY.

(I) REMEMBER THAT THE WEAKEST LINK FOR ANY RECEIVING SYSTEM IS THE ANTENNA.

(J) IF YOU HAVE DIFFICULTY SELECTING ANTENNAS OR FEED LINES FOR YOUR INSTALLATION, CALL THE SALES DEPARTMENT AT MTS FOR RECOMMENDATIONS.

2.0 INSTALLING THE SYSTEM 1000

THERE ARE SIX BASIC TYPES OF INSTALLATIONS:

(1) LOCAL MODE- MONO- SINGLE PORT

(2) LOCAL MODE- MONO - DUAL PORT

(3) LOCAL MODE- STEREO - DUAL PORT

(4) LOCAL MODE- STEREO - THREE PORT

(5) REMOTE VERSIONS OF 1-4

THE REMOTE SYSTEM INSTALLATION IS ESSENTIALLY THE SAME AS THE LOCAL INSTALLATION AS FAR AS THE AUDIO INTERFACE IS CONCERNED, WE WILL COVER THE LOCAL TYPE INSTALLATIONS FIRST.

LOCAL MODE - MONO - SINGLE PORT

THIS TYPE OF INSTALLATION IS VERY SIMPLE. THE PROGRAM AUDIO AND ENCODER OUTPUT AUDIO, IS FROM A SINGLE 600 OHM BALANCED OUTPUT CALLED "AUDIO OUT" AT J1 PINS 03 AND 16 ON THE REAR PANEL. THIS OUTPUT IS LEVEL ADJUSTABLE FROM -25 dBM TO +8 dBM 600 OHMS VIA R75 ON THE AUDIO PROCESSOR MODULE. IN THIS MODE, RECEIVER AUDIO IS PRESENT AT THE AUDIO OUT PORT ANY TIME THAT THE SYSTEM IS UN-MUTED VIA THE FRONT PANEL MUTE CONTROL. THE ENCODER OUTPUT IS PRESENT FOR 22.5 SECONDS AFTER THE FRONT PANEL ALARM SEND BUTTON IS DEPRESSED. THE FRONT PANEL RESET BUTTON IS USED TO RESET THE SYSTEM AFTER COMPLETION OF AN EBS TEST OR ALERT. NOTE: THE ENC/PGM OPTION MUST BE ENABLED IN THE AUDIO PROCESSOR MODULE FOR THIS MODE OF OPERATION.

LOCAL MODE - MONO - DUAL PORT

THIS TYPE OF INSTALLATION IS BASICALLY THE SAME AS THE SINGLE PORT TYPE WITH THE EXCEPTION THAT A SEPARATE PORT IS USED FOR THE ENCODER OUTPUT. THE ENCODER PORT IS AT J1 PINS 01 AND 02 ON THE REAR PANEL. THIS OUTPUT IS A 600 OHM BALANCED PORT THAT IS LEVEL ADJUSTABLE FROM -20 dBM TO +8 dBM VIA R83 ON THE AUDIO PROCESSOR MODULE. THE SAME OPERATIONAL CHARACTERISTICS AS THE SINGLE PORT METHOD APPLY.

LOCAL MODE - STEREO - TWO PORT

THIS TYPE OF INSTALLATION APPLIES TO STEREO STATIONS. IN THIS CASE THE LEFT AND RIGHT AUDIO OUTPUT PORTS ARE USED FOR PROGRAM AUDIO AND THE ENCODER OUTPUT. THE LEFT AUDIO OUTPUT, J1 PINS 21 AND 09, IS AN ALARM SWITCHED 600 OHM BALANCED OUTPUT THAT IS LEVEL ADJUSTABLE VIA R75 ON THE AUDIO PROCESSOR MODULE. THE RIGHT AUDIO OUTPUT, J1 PINS 23 AND 11, IS THE SAME TYPE OF OUTPUT AS THE LEFT AUDIO OUTPUT. R78 CONTROLS THE RIGHT AUDIO OUTPUT LEVEL. BOTH CHANNELS ARE LEVEL ADJUSTABLE FROM -25dBM TO +8dBM. THE OPERATIONAL CHARACTERISTICS ARE DIFFERENT FROM THE OTHER MODES IN THE RESPECT THAT THE AUDIO OUTPUTS ARE ONLY ENABLED AFTER A SUCCESSFUL EBS DECODE, OR WHEN THE ALARM SEND BUTTON ON THE FRONT PANEL IS DEPRESSED. NOTE THAT WHEN ALARM SEND IS DEPRESSED THAT THE RECEIVER AUDIO IS MUTED. THE ENC/PGM OPTION MUST BE ENABLED FOR THIS MODE OF OPERATION AS WELL.

LOCAL MODE - STEREO - THREE PORT

THIS TYPE OF INSTALLATION IS BASICALLY THE SAME AS THE STEREO TWO PORT TYPE WITH THE EXCEPTION THAT THE ENCODER OUTPUT PORT IS UTILIZED.

REMOTE OPERATION

THIS TYPE OF INSTALLATION MAY INCORPORATE ANY OF THE AUDIO ROUTING TYPES DESCRIBED ABOVE. THE FOLLOWING INPUTS AND OUTPUTS ARE USED TO CONTROL AND MONITOR THE STATUS OF THE SYSTEM 1000:

RESET INPUT- J1 PIN 07. APPLYING A NEGATIVE GOING PULSE (TTL LEVEL) WITH A DURATION OF 100 mSEC WILL RESET THE SYSTEM FROM ANY ALARM MODE.

****

NOTE: THIS "NEGATIVE GOING TTL LEVEL PULSE" IS SIMPLY A PULL TO GROUND TO ACTIVATE THE FUNCTION. DEBOUNCING AND OTHER SIGNAL CONDITIONING OCCURS INSIDE THE UNIT. DO NOT APPLY ANY POSITIVE OR NEGATIVE VOLTAGES TO THESE INPUTS OR YOU WILL DAMAGE THE UNIT AND VOID THE WARRANTY.

****

ALARM SEND- J1 PIN 06. APPLYING A NEGATIVE GOING PULS (TTL LEVEL) WITH A DURATION OF 100mSEC WILL START THE ENCODE SEQUENCE.

ALARM OUTPUT- J1 PIN 05. THIS OUTPUT IS AN OPEN COLLECTOR ACTIVE LOW OUTPUT. THIS OUTPUT WILL BE LOW DURING ANY ALARM MODE. THIS OUTPUT CAN BE USED FOR SEVERAL PURPOSES INCLUDING CONTROLLING A RECORDER FOR RECORD KEEPING. OUTPUT IS RATED FOR 20VDC MAX AT 15mA SINK CURRENT MAX.

A/T FAIL OUTPUT- J1 PIN 20. THIS OUTPUT IS AN OPEN COLLECTOR ACTIVE LOW OUTPUT. THIS OUTPUT WILL BE LOW ONLY WHEN THE AUTO TEST ROUTINE HAS DETERMINED THAT A PROBLEM EXISTS. SEE AUTOTEST SECTION FOR MORE DETAILS. SAME OUTPUT SPECS AS THE ALARM OUTPUT.

GROUND- J1 PIN 4

WHEN USING THE A/T FAIL OR ALARM OUTPUTS, IT WILL BE NECESSARY TO PROVIDE AN EXTERNAL PULL-UP RESISTOR IN SOME CASES (USUALLY WHEN INTERFACING TO A DIGITAL REMOTE CONTROLLER, FOR EXAMPLE). TYPICALLY A 10K 1/4W RESISTOR TO +5VDC IS ADEQUATE.

GENERAL NOTES

ALWAYS PROVIDE A GOOD EARTH GROUND. THE GROUND STUD IS LOCATED ON THE REAR PANEL....USE IT!

ALWAYS INSTALL THE HEADSHELL ON YOUR INTERFACE CABLE. ALWAYS SECURE THE CONNECTOR USING THE HEADSHELL SCREWS.

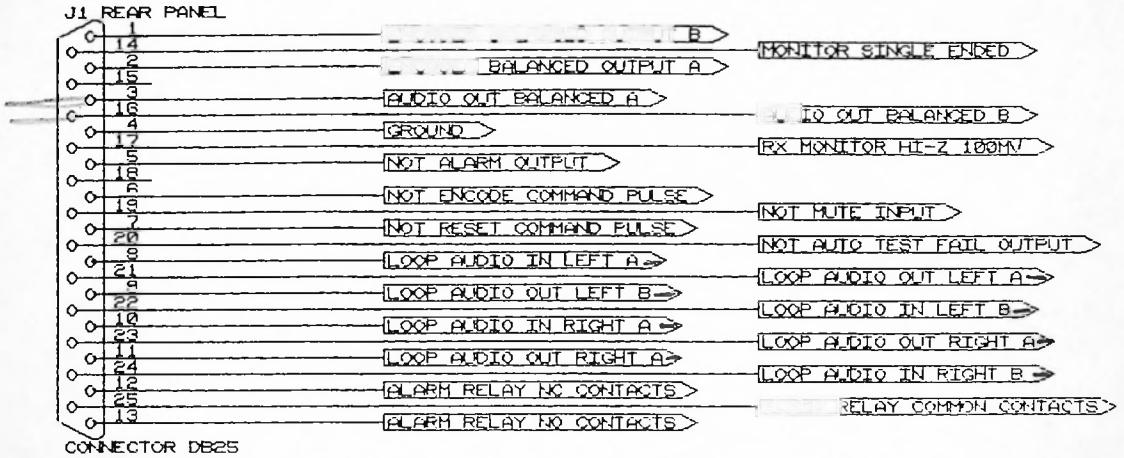
A "DRY CONTACT" CLOSURE AND OPENING HAVE BEEN PROVIDED AT J1 PINS 25 COMMON, 13 NORMALLY OPEN, 12 NORMALLY CLOSED, FOR ALARM SIGNALING. DO NOT USE THESE CONNECTIONS FOR AC SWITCHING!! MTS RATES THIS PORT FOR DC SWITCHING, 50 V MAX 0.5 AMP MAX.

THE ANTENNA CONNECTIONS AT THE MONITOR

THE RECEIVER HAS A TYPE F CONNECTOR ON THE REAR PANEL OF THE SYSTEM 1000. DO NOT OVER TIGHTEN. FINGER TIGHT IS ADEQUATE.

DONT FORGET THE POWER SUPPLY!

CONNECT THE FOUR PIN PLUG FROM THE POWER TRANSFORMER TO THE FOUR PIN SOCKET ON THE REAR PANEL. MAKE SURE THE RETAINING RING IS SCREWED DOWN FINGER TIGHT.



NOTES:

STATUS OUTPUTS ARE TTL OPEN COLLECTOR

COMMAND INPUTS ARE TTL LEVEL ACTIVE LOW

"PULSE" INPUTS ARE TTL ACTIVE LOW 100mSEC

BALANCED OUTPUTS ARE 600 OHM TRANSFORMER COUPLED

DO NOT USE ALARM RELAY FOR AC SWITCHING
50 VOLTS DC 1AMP MAX

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150 CLAYTON COMMERCE CENTER
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Title
SYSTEM 1000 REAR PANEL INTERFACE

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Date: August 17, 1989 Sheet of 1

SECTION FIVE: OPERATION

FRONT PANEL CONTROLS

THE FRONT PANEL HAS A TOTAL OF THREE CONTROLS AND THREE STATUS INDICATORS: ALARM SEND, MUTE, RESET, AUTO-TEST PASS, AUTO-FAIL, AND ALARM INDICATOR.

THE MUTE CONTROL

THE MUTE CONTROL IS ALSO A LOCKING PUSH BUTTON CONTROL THAT IS ACTIVE (MUTED) WHEN IN THE DEPRESSED POSITION. THIS CONTROL IS USED TO MUTE (EXCEPT IN ANY ALARM MODE) THE SPEAKER AUDIO AS WELL AS THE REAR PANEL AUDIO OUTPUTS. AFTER ANY EBS DECODE THE MUTE IS INTERNALLY DISABLED UNTIL A RESET OCCURS.

THE RESET CONTROL

THE RESET CONTROL IS A MOMENTARY PUSH BUTTON. THIS CONTROL IS USED TO RESET THE SYSTEM TO THE NORMAL MONITORING MODE AFTER ANY EBS DECODE CYCLE. THIS CONTROL CAN ALSO BE USED AT ANY POINT DURING AN EBS ENCODE (ALARM SEND) CYCLE TO HALT THE CYCLE AND RETURN TO NORMAL MONITORING.

THE ALARM SEND CONTROL

THE ALARM SEND (ENCODE) CONTROL IS THE LARGE RED MOMENTARY PUSH BUTTON THAT IS PROTECTED BY THE SWITCH GUARD. DEPRESSING THE ALARM SEND BUTTON WILL CAUSE THE SYSTEM TO GO TO THE ALARM MODE AND GENERATE THE EBS TONES FOR A PERIOD OF 22.5 SECONDS. DURING THE ALARM SEND PERIOD, THE SCAN ROUTINE IS HALTED AND THE RECEIVER AUDIO IS MUTED. NO DECODE CYCLE IS POSSIBLE DURING THIS 22.5 SECOND PERIOD. THE RESET CONTROL (FRONT OR REAR PANEL) CAN BE USED TO STOP THE ENCODE CYCLE AT ANY POINT, IF REQUIRED.

THE AUTO TEST INDICATORS

THE AUTO TEST SECTION OF THE FRONT PANEL HAS TWO INDICATORS: PASS AND FAIL. THE TEST CRITERIA FOR A PASS CONDITION ARE: THE RECEIVER IS FUNCTIONAL WITH VALID INPUT, EBS DECODER IS FUNCTIONAL, AND EBS ENCODER IS FUNCTIONAL. IT IS NORMAL, AT POWER UP, FOR THE A/T FAIL INDICATOR TO BE ON FOR ABOUT 1 SECOND.

REMOTE OPERATION

REMOTE OPERATION OF THE SYSTEM 1000 IS ESSENTIALLY THE SAME AS FROM THE FRONT PANEL. ALL OF THE CONTROLS ARE AVAILABLE AT J1 ON THE REAR PANEL.

SECTION SIX: TROUBLESHOOTING GUIDE

THIS GUIDE HAS BEEN DESIGNED TO ISOLATE PROBLEMS TO THE MODULE LEVEL. CONSULT THE OPERATION SECTION OF THIS MANUAL BEFORE TROUBLE SHOOTING!

SYMPTOM	POSSIBLE CAUSE
NO LIGHTS ON FRONT PANEL	DEFECTIVE POWER TRANSFORMER FUSE F1 IN POWER SUPPLY MODULE DEFECTIVE POWER SUPPLY MODULE
AUTO-TEST FAIL LIGHT ON	CPCS1 OFF THE AIR INSUFFICIENT SIGNAL INPUT TO RECEIVER. DEFECTIVE RECEIVER MODULE DEFECTIVE AUDIO PROCESSOR MODULE.
NO SPEAKER AUDIO	DEFECTIVE RECEIVER MODULE. SYSTEM MUTED. DEFECTIVE AUDIO PROCESSOR MODULE
ALL FRONT PANEL LIGHTS ON	DEFECTIVE AUDIO PROCESSOR MODULE

FOR OTHER SYMPTOMS, PLEASE CALL MTS FACTORY SERVICE DEPARTMENT. WE RECOMMEND THAT DEFECTIVE MODULES BE RETURNED TO THE FACTORY FOR REPAIR AND CALIBRATION. CONSULT SECTION 14 OF THIS MANUAL FOR INFORMATION ON FACTORY SERVICE AND MODULE SPARES.

SECTION SEVEN: THE POWER SUPPLY MODULE

ENVIRONMENTAL

OPERATING TEMPERATURE RANGE: 0 TO +50 DEGREES CELSIUS.

STORAGE TEMPERATURE RANGE: -35 TO +85 DEGREES CELSIUS.

ENVIRONMENT CLASSIFICATION: IN DOOR, EXTENDED.

HUMIDITY: 0 TO 95% NON CONDENSATING.

INPUT REQUIREMENTS

AC INPUT: 20 VOLTS AC 60 HZ TO 28 VOLTS AC 60 HZ.

OUTPUT CHARACTERISTICS

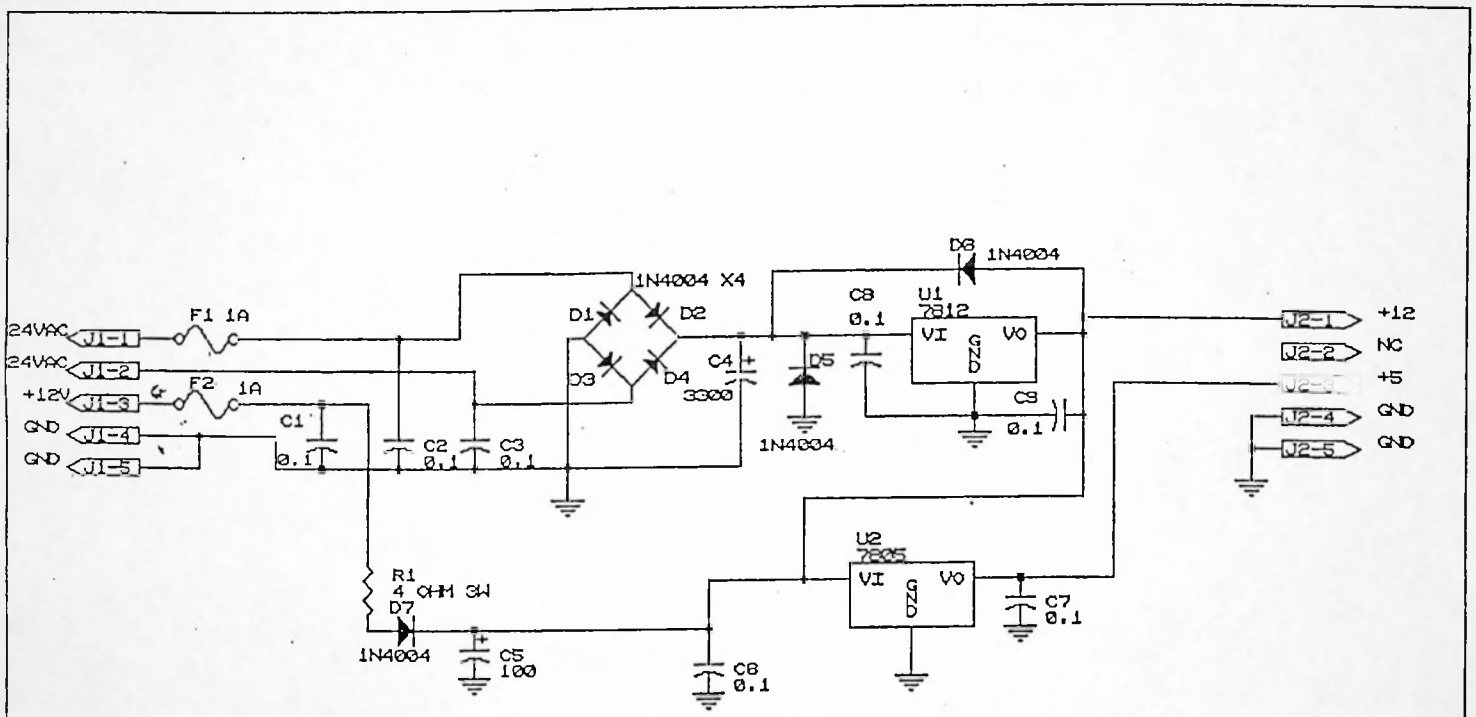
+12 VOLTS DC +/- 0.2 VDC AT 300 mA MAX. RIPPLE LESS THAN 50 mV AT 150 mA LOAD CURRENT.

+5 VOLTS DC +/- 0.2 VDC AT 300 mA MAX. RIPPLE LESS THAN 50 mV AT 150 mA LOAD CURRENT.

GENERAL

THIS POWER SUPPLY MODULE CONSISTS OF FOUR BASIC BLOCKS: (1) AC RECTIFICATION/FILTERING: (2) 12 VDC REGULATOR; (3) 5 VDC REGULATOR, AND; (4) EXTERNAL DC INPUT CIRCUIT.

THIS CIRCUIT IS INTENDED FOR USE WITH AN EXTERNAL 24 VAC 1AMP WALL TRANSFORMER. REGULATED OUTPUTS ARE 12 VDC AT 300 mA MAX AND 5 VDC AT 300 mA MAX.



REV.1 3/19/89 ADD C8,9 RF DECOUPLING

MULTI-TECHNICAL SERVICES 150 CLAYTON COMMERCE CENTER CLAYTON, N.C. 27520 (919) 553-2895		
Title: SCHEMATIC: POWER SUPPLY MODULE		
Size: A	Document Number: 1085-601	REV: 1
Date: March 19, 1989	Sheet 1 of 1	

SECTION EIGHT: THE FM BROADCAST RECEIVER MODULE

ENVIRONMENT

TEMPERATURE RANGE (STORAGE): -35 TO +85 DEGREES CELSIUS

TEMPERATURE RANGE (OPERATING): 0 TO +50 DEGREES CELSIUS

HUMIDITY: 0 TO 90% NON-CONDENSATING

ENVIRONMENT TYPE: INDOOR - EXTENDED

POWER REQUIREMENTS

REGULATED +5.0 VOLTS DC +/- 0.2 V DC AT 5 mA MAX.

PERFORMANCE CHARACTERISTICS

INPUT FOR 10 dB S/N: 4uV

INPUT FOR 26 dB SINAD: 7uV

THD @ DELTA F= 22.5KHz: 0.7%

THD @ DELTA F= 75KHz: 2.3%

S/N: 60dB

AM SUPPRESSION: 50dB

RIPPLE REJECTION: 30dB

DELTA LO FREQ/TEMP: 0.2KHz/DEGREE

AFC RANGE: 160KHz

AUDIO BANDWIDTH: 7KHz

AUDIO OUTPUT: 90mV RMS.

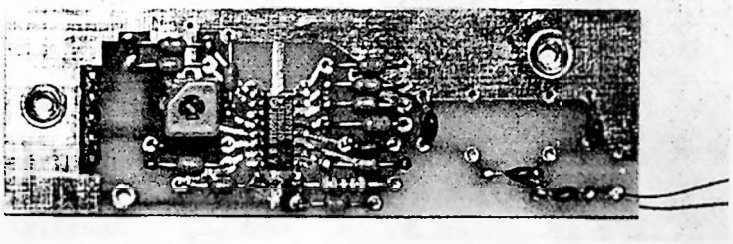
GENERAL

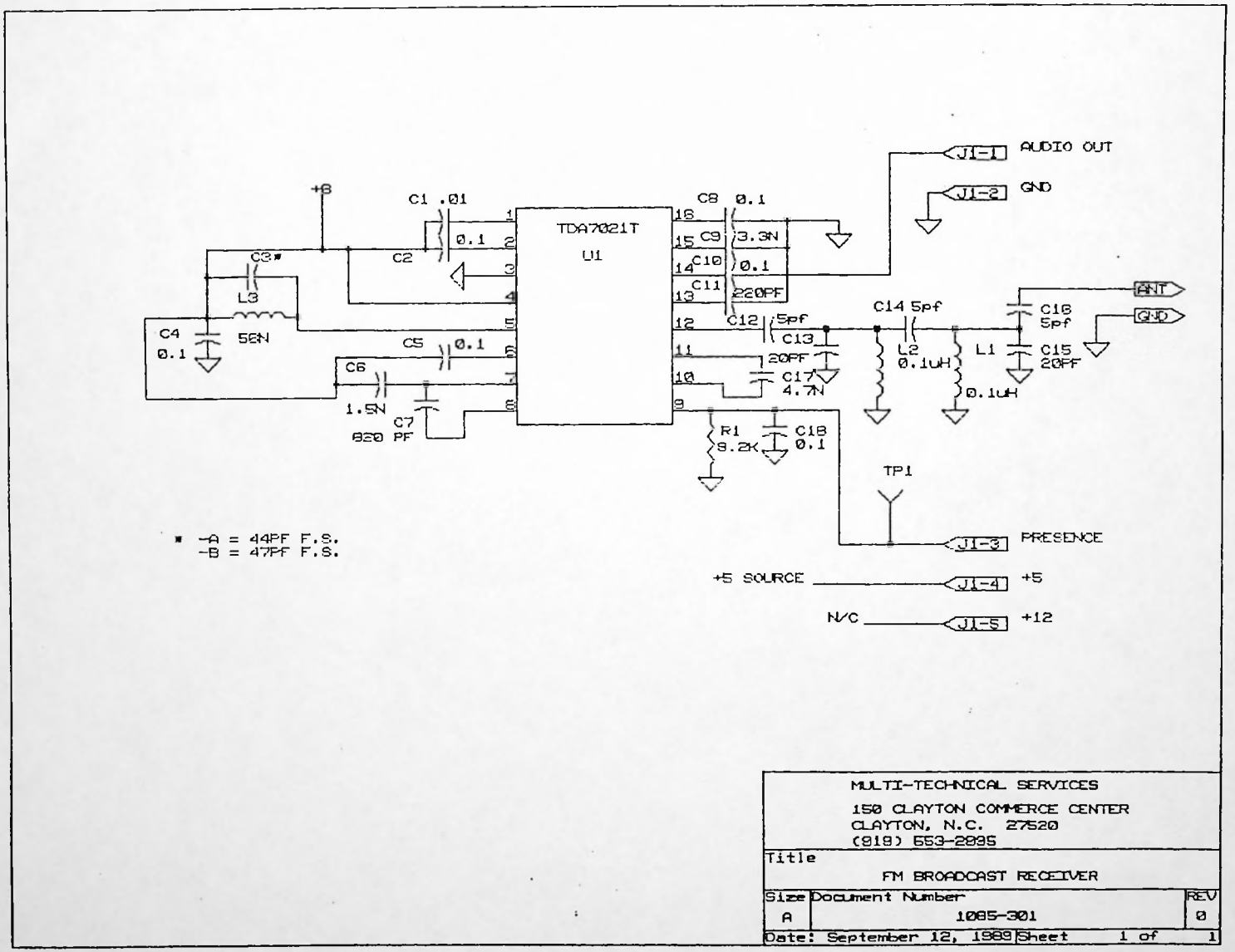
THIS RECEIVER MODULE IS AN FM BROADCAST RECEIVER INTENDED FOR USE WITH THE SYSTEM 3000C EBS MONITOR. THE RECEIVER HAS BEEN DESIGNED FOR OPERATION WITH 50 AND 75 OHM ANTENNAS. THE MODULE FEATURES INCLUDE: SINGLE SUPPLY LOW CURRENT, RSSI OUTPUT, 7 KHz AUDIO BANDWIDTH, DISTORTION LESS THAN 1%, AND EXCELLENT ADJACENT CHANNEL REJECTION.

TECHNICAL

THE RECEIVER IS BASED ON THE SIGNETICS TDA7021T INTEGRATED RECEIVER CIRCUIT USING FREQUENCY LOCKED LOOP TECHNOLOGY, WITH THE ADDITION OF A DOUBLE TUNED FRONT END. THE DOUBLE TUNED FRONT END, CONSISTING OF C16, C15, L1, C14, L2, AND C13, HAS BEEN ADDED TO GIVE CONSIDERABLE ATTENUATION TO ADJACENT CHANNEL STATIONS.

THE LOCAL OSCILLATOR IS A STABILIZED L/C NETWORK CONSISTING OF L3 AND C3. THE TUNING IS ACCOMPLISHED VIA L3. THE RSSI SIGNAL STRENGTH OUTPUT SIGNAL IS AVAILABLE AT TP1. THIS SIGNAL IS A NEGATIVE GOING SIGNAL. AT 5 uV RF INPUT, THE VOLTAGE AT TP1 SHOULD BE 1.25 VOLTS DC, WHICH IS THE PRESENCE THRESHOLD USED BY THE AUDIO PROCESSOR BOARD.





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Title: FM BROADCAST RECEIVER		
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Date: September 12, 1989	Sheet 1 of 1	

SECTION NINE: AM BROADCAST RECEIVER MODULE P/N 2017-500

ENVIRONMENT

TEMPERATURE RANGE (STORAGE): -35 TO +85 DEGREES C.

TEMPERATURE RANGE (OPERATING): 0 TO +50 DEGREES C.

HUMIDITY: 0 TO 90% NON-CONDENSATING

ENVIRONMENT TYPE: INDOOR - EXTENDED

POWER REQUIREMENTS: +12 VOLTS DC +/- .2 VDC AT 25 mA MAX
+5 VOLTS DC +/- .2 VDC AT 1 mA MAX

PERFORMANCE CHARACTERISTICS

FREQUENCY COVERAGE: 530 kHz TO 1610 kHz

INPUT SENSITIVITY: LESS THAN 10uV FOR 10 dB SINAD

AUDIO BANDWIDTH: 5 kHz

ADJACENT CHANNEL REJECTION: GREATER THAN 25 dB

THD: LESS THAN 10.0% AT 30% MOD AT 0.75V RF INPUT.

AGC RANGE: GREATER THAN 80 dB

ULTIMATE SIGNAL TO NOISE: GREATER THAN 55 dB.

RF INPUT IMPEDANCE: APPX 50 OHMS.

TECHNICAL DESCRIPTION

FRONT END

THE TUNED FRONT END CONSISTS OF THREE VARACTOR TUNED STAGES. THE ANTENNA INPUT (PRIMARY OF T3) IS A LOW IMPEDANCE (50 OHMS AT 1 MHz) WINDING. THE SECONDARY IS A RELATIVELY HI-Z WINDING (1K AT 1MHz) AND IS TUNED BY VARYING THE VOLTAGE ACROSS THE VARACTOR D3. SUBSEQUENT STAGES AT T4 AND T1 FUNCTION IN MUCH THE SAME MANNER. NOTE THAT THE TUNING VOLTAGE IS DERIVED FROM THE VOLTAGE DIVIDER CONSISTING OF R17 AND POT R11. THE TUNED OUTPUT OF T1 IS COUPLED TO THE RF INPUT OF U1 VIA C2. THE INTERNAL RF AMP IS INTERNALLY GAIN CONTROLLED AND HAS AN EXCEPTIONALLY AGC RANGE IN EXCESS OF 80 dB.

LOCAL OSCILLATOR

THE MAJORITY OF THE LOCAL OSCILLATOR IS ON BOARD THE TDA1072 RECEIVER IC. THE EXTERNAL COMPONENTS ARE JUST THE TUNING INDUCTANCE, L1, AND RANGE CAPACITORS, C16-C19. CAPACITORS C16-19 ARE STABLE NPO TYPES AND L1 IS USED TO ADJUST THE FREQUENCY. HI-SIDE INJECTION IS USED IN THIS RECEIVER WHICH MEANS THAT THE LOCAL OSCILLATOR FREQUENCY IS F(OPERATING) + 455 kHz. THE TUNING RANGE VERSUS RANGE CAPACITOR IS AS FOLLOWS:

SW1-4 ON ALL OTHERS OFF	1400-1610
SW1-3 ON ALL OTHERS OFF	1150-1400
SW1-2 ON ALL OTHERS OFF	0750-1150
SW1-1 ON ALL OTHERS OFF	0530-0750

IF FILTER

THE MIXER OUTPUT IS AT PIN 1 OF U1 AND IS TUNED TO 455 kHz BY THE PRIMARY OF T2 AND C7. THE LOW IMPEDANCE SECONDARY OF T2 DRIVES THE IF FILTER WHICH IS A CERAMIC BANDPASS FILTER WITH A CENTER FREQUENCY OF 455 kHz AND A 5 kHz BANDPASS.

RELATIVE SIGNAL STRENGTH AND CARRIER PRESENT CIRCUITRY

THE TDA 1072 HAS A POSITIVE GOING RELATIVE SIGNAL STRENGTH OUTPUT THAT IS USED TO DRIVE A DC COMPARISON. THE SIGNAL STRENGTH OUTPUT IS AVAILABLE TO TP2. THE COMPARATOR IS ONE SECTION OF AN LM393 WITH THE REFERENCE VOLTAGE BEING DETERMINED BY DIVIDER NETWORK R12 AND R6, AND HYSTERISIS BY R14. THE CARRIER PRESENT OUTPUT (J1-3) WILL GO LOW WHEN THE SIGNAL STRENGTH OUTPUT IS ABOVE 1 VOLT DC. 1VDC SIGNAL STRENGTH CORRELATES TO APPROXIMATELY 5 uV RF INPUT.

AUDIO OUTPUT

THE DETECTED AUDIO OUTPUT COMES FROM PIN 6 OF U1 AND IS FILTERED BY C9, R3, AND C12. R4 IS THE LOAD RESISTOR AND C4 IS THE OUTPUT COUPLING CAPACITOR. FULL AUDIO OUTPUT IS 90 mV RMS IN A 100K LOAD.

TUNE UP PROCEDURE

(1) INJECT A 80% MODULATED CARRIER AT YOUR DESIRED OPERATING FREQUENCY AT -30 dBm.

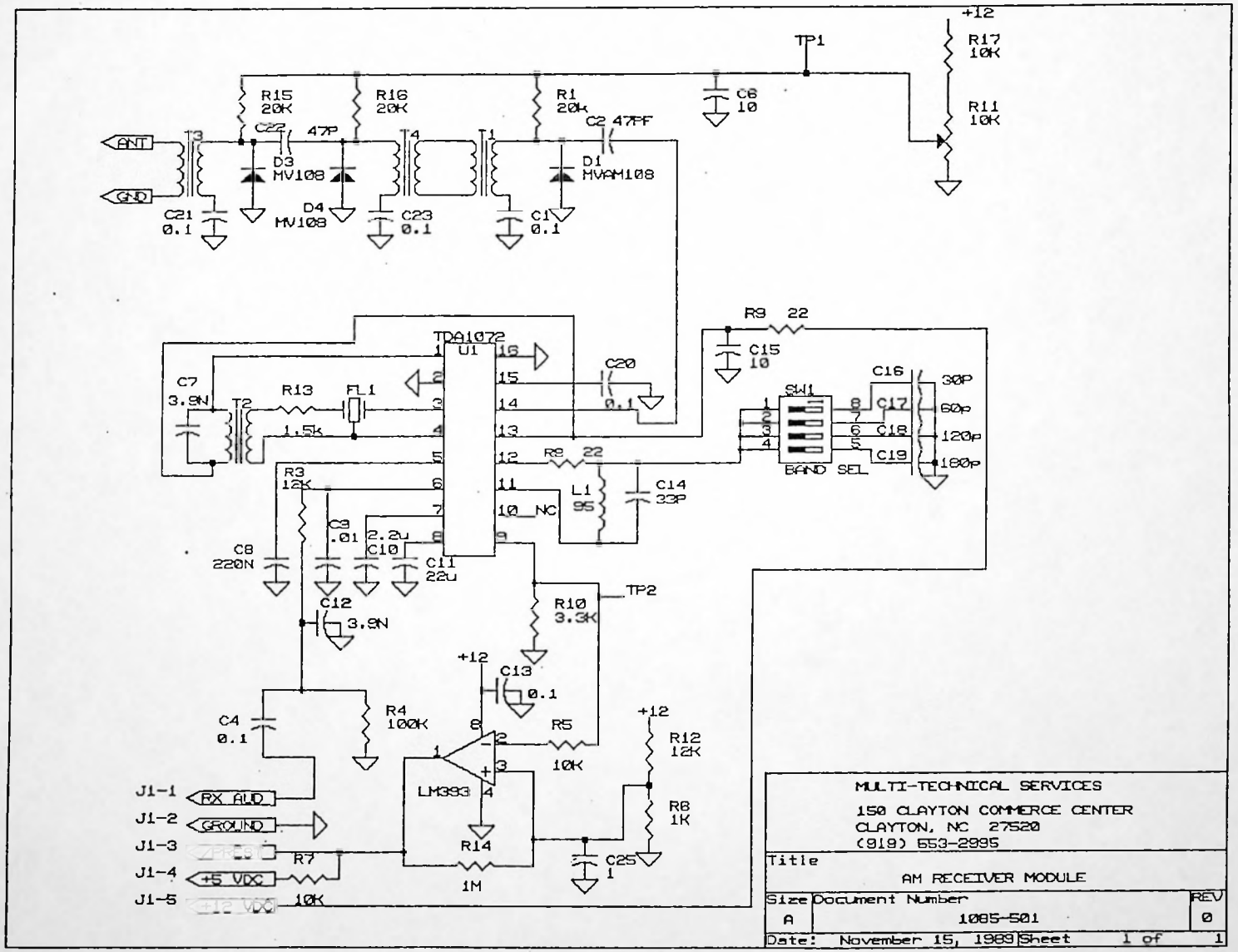
(2) SELECT THE RANGE CAPACITOR FROM THE TABLE ABOVE.

(3) CONNECT A DVM TO TP1 AND GROUND (3V SCALE).

(4) TUNE L1 FOR MAXIMUM VOLTAGE AT TP2.

(5) TUNE R11 (FRONT END) FOR MAXIMUM VOLTAGE AT TP2.

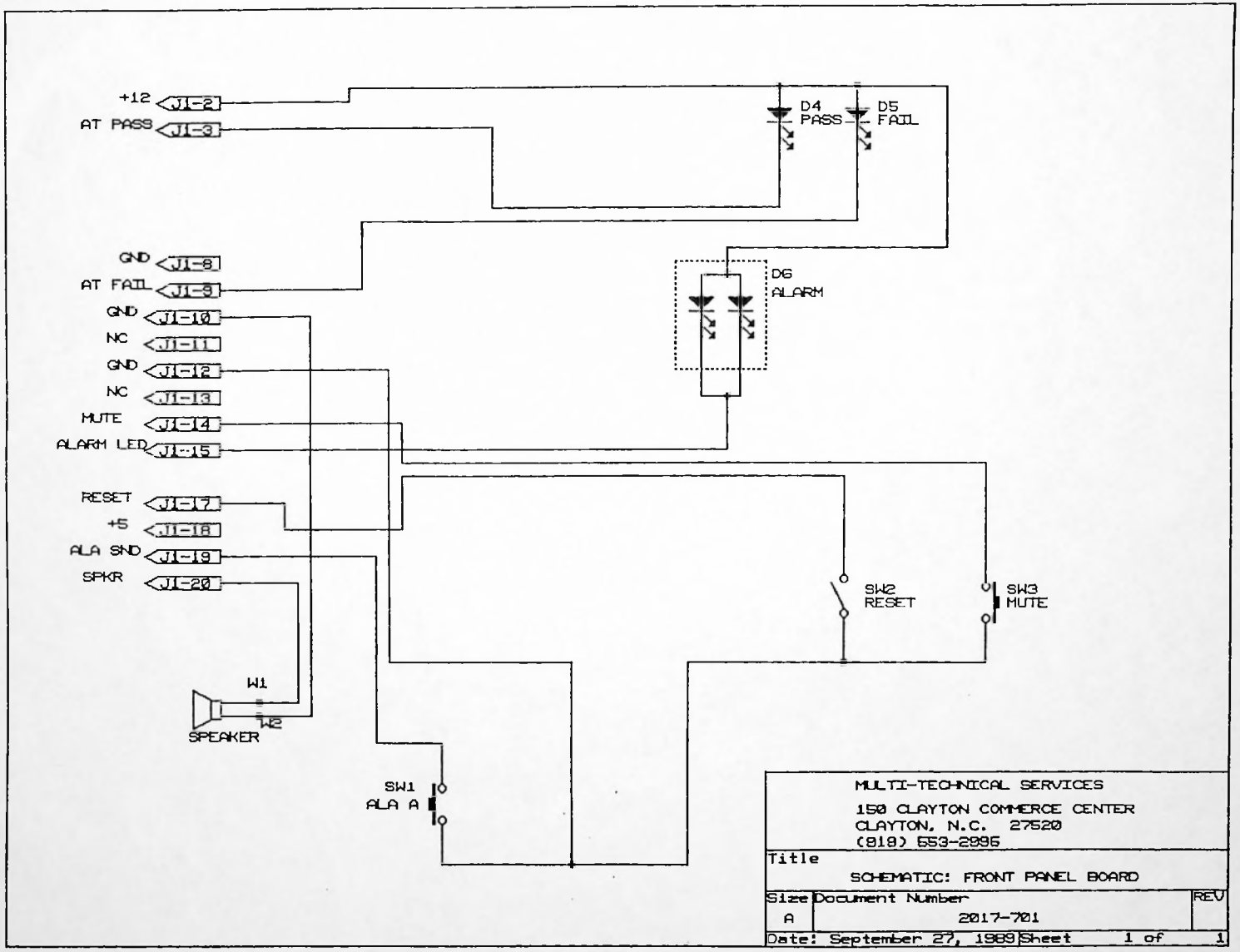
(6) REDUCE SIGNAL GENERATOR OUTPUT TO 15 uV. FINE TUNE BOT L1 AND R11 FOR MAXIMUM VOLTAGE AT TP2. DO NOT ADJUST T1-4. THESE CIRCUITS ARE PRESET AT THE FACTORY AND REQUIRE NO ADJUSTMENT. VERIFY THAT THE VOLTAGE AT TP2 IS IN EXCESS OF 1 VDC WITH 15 uV RF INPUT.


+12
TP1
R17
10K
R11
10K
R15
20K
R16
20K
R1
20K
C22
47P
C2 47PF
C8
10
ANT
GND
D3
MV108
D4
MV108
D1
MVAM108
C21
0.1
C23
0.1
C1
0.1
R9 22
C15
10
TDA1072
U1
C20
0.1
C16
30P
C17
60P
C18
120P
C19
180P
SW1
BAND SEL
C7
3.9N
T2
R13
1.5K
FL1
R8 22
R3
12K
L1
95
C14
33P
C9
.01
C10
2.2U
C11
22U
C8
220N
C12
3.9N
TP2
R10
3.3K
+12
C13
0.1
C4
0.1
R4
100K
R5
10K
+12
R12
12K
R8
1K
LM393
R14
1M
C25
1
J1-1
RX AUD
J1-2
GROUND
J1-3
J1-4
+5 VDC
J1-5
10K
MULTI-TECHNICAL SERVICES
150 CLAYTON COMMERCE CENTER
CLAYTON, NC 27520
(919) 553-2995
Title
AM RECEIVER MODULE
Size
A
Document Number
1085-501
REV
0
Date: November 15, 1989
Sheet 1 of 1

SECTION TEN: THE FRONT PANEL ASSEMBLY

J1, THE 20 PIN HEADER LOCATED ON THE PCB ASSEMBLY, IS THE SIGNAL AND POWER INTERCONNECT FOR THE ENTIRE FRONT PANEL. THE FOLLOWING SIGNALS APPEAR AT J1:

J1-2	+12 VOLTS DC INPUT	SOURCE FOR LED'S
J1-3	AT PASS ACTIVE LED	ACTIVE LOW INPUT
J1-8	GROUND	GROUND
J1-9	AT FAIL ACTIVE LED	ACTIVE LOW INPUT
J1-10	SPEAKER GROUND	AUDIO RETURN
J1-11	NOT USED	
J1-12	GROUND	
J1-13	NOT USED	
J1-14	MUTE	ACTIVE LOW OUTPUT
J1-15	ALARM ACTIVE LED	ACTIVE LOW INPUT
J1-17	RESET	ACTIVE LOW OUTPUT MOMENTARY
J1-18	+5 VOLTS DC	RESERVED
J1-19	ALARM SEND	ACTIVE LOW OUTPUT MOMENTARY
J1-20	SPEAKER AUDIO	+AUDIO TO SPEAKER


+12
J1-2
AT PASS
J1-3
GND
J1-8
AT FAIL
J1-9
GND
J1-10
NC
J1-11
GND
J1-12
NC
J1-13
MUTE
J1-14
ALARM LED
J1-15
RESET
J1-17
+5
J1-18
ALA SND
J1-19
SPKR
J1-20
D4
PASS
D5
FAIL
D6
ALARM
SW2
RESET
SW3
MUTE
W1
W2
SPEAKER
SW1
ALA A
MULTI-TECHNICAL SERVICES
150 CLAYTON COMMERCE CENTER
CLAYTON, N.C. 27520
(919) 553-2995
Title
SCHEMATIC: FRONT PANEL BOARD
Size
A
Document Number
2017-701
REV
Date: September 27, 1989
Sheet 1 of 1

SECTION ELEVEN: THE AUDIO PROCESSOR MODULE

ENVIRONMENT SPECIFICATIONS

TEMPERATURE RANGE (STORAGE): -35 TO +85 DEGREES CELSIUS

TEMPERATURE RANGE (OPERATING): 0 TO +50 DEGREES CELSIUS

HUMIDITY: 0-95% NON CONDENSATING

ENVIRONMENT TYPE: INDOOR- EXTENDED

RF ENVIRONMENT: 10.0 VOLTS PER METER AM FIELD
0.5 VOLTS PER METER FM FIELD

INPUT POWER REQUIREMENTS

+12.0 VOLTS DC +/- 0.2 VDC REGULATED @ 300 mA MAX.
+ 5.0 VOLTS DC +/- 0.2 VDC REGULATED @ 300 mA MAX.

INPUT SIGNAL REQUIREMENTS

RECEIVER AUDIO INPUT: PIN1 OF J1: 90mV RMS +/-
10 mV AC COUPLED

RX PRESENT INPUT: PIN3 OF J1: DC VOLTAGE LESS THAN
1.5 VDC FOR PRESENT CONDITION.

REAR PANEL INPUTS:

J4-12 MUTE: ACTIVE LOW TTL. MUST SINK 2 mA.

J4-11 ALARM SEND: ACTIVE LOW TTL. MUST SINK 2 mA.

J4-13 RESET: ACTIVE LOW TTL PULSE. .1 SEC

FRONT PANEL INPUTS:

J5-4 CH1 ENABLE: ACTIVE LOW TTL. MUST SINK 2 mA.

J5-17 RESET: ACTIVE LOW TTL PULSE 0.1 SEC

J5-14 MUTE: ACTIVE LOW TTL. MUST SINK 2 mA.

J5-19 ALARM SEND: ACTIVE LOW TTL PULSE 0.1 SEC

DTMF RESET OPTION INPUTS:

J6-5 DATA STROBE: ACTIVE LOW TTL PULSE 20mSEC WHEN DATA VALID.

J6-4 DATA A: ACTIVE LOW TTL (LSB)

J6-3 DATA B: ACTIVE LOW TTL

J6-2 DATA C: ACTIVE LOW TTL

J6-1 DATA A: ACTIVE LOW TTL

OUTPUT SIGNAL SPECIFICATIONS

FRONT PANEL OUTPUTS:

J5-1 CH1 LED: ACTIVE LOW WILL SINK 10mA 12 V.

J5-15 ALARM LED: ACTIVE LOW WILL SINK 20mA 12V.

J5-9 AT FAIL LED: ACTIVE LOW WILL SINK 10 mA 12V

J5-3 AT PASS LED: ACTIVE LOW WILL SINK 10 mA 12V

J5-19 SPEAKER AUDIO: 0.2WATTS MAX INTO 8 OHMS 5%THD MAX.

REAR PANEL OUTPUTS:

****

NOTE: THESE PINS ARE THE HEADER PINS AT J4 ON THE AUDIO PROCESSOR MODULE NOT THE DB-25 ON THE REAR PANEL.

****

ENCODER OUTPUT: J4 PINS 1 AND 3:

600 OHM BALANCED LINE. LEVEL ADJUSTABLE -20dBM TO +8 dBm.
TONE A = 853 +/- 0.25 Hz. TONE B = 960 +/- 0.25 Hz.
TONES BALANCED WITHIN 0.5dB.
DISTORTION: 2% MAX. DURATION 22.5 SECONDS.

AT FAIL: J4 PIN 14:

OPEN COLLECTOR TTL. WILL SINK 15mA 20V MAX.
ACTIVE LOW. DIODE PROTECTED.

AUDIO: J4 PINS 5 AND 6

600 OHM BALANCED LINE. LEVEL ADJUSTABLE -20 dBM TO +8 dBM. DISTORTION 2% MAX.

ALARM OUT: J4 PIN 9

OPEN COLLECTOR TTL. WILL SINK 15mA 20V MAX.
ACTIVE LOW. DIODE PROTECTED.

RX MONITOR: RX1M J4 PIN 8.

HI IMPEDANCE MONITOR PORT. NOMINAL LEVEL 90mV RMS INTO 100K LOAD Z. CAUTION: USE AC COUPLED AMPLIFIER ONLY!.

DRY CONTACTS FOR ALARM NOTIFICATION: J4 PINS 23,24, AND 25.

RELAY CONTACTS 0.5 AMPERE 50 VDC. COMMON ON PIN 24, NORMALLY CLOSED ON PIN 23, NORMALLY OPEN ON PIN 25. NO AC SWITCHING PERMITTED. WARRANTY VOID IF USED TO SWITCH AC LOADS.

MONITOR OUTPUT: J4 PIN 2

SINGLE ENDED OUTPUT. LEVEL ADJUSTABLE FROM -20 dBM TO +8dBM. 5% DISTORTION MAX.

LEFT AND RIGHT CHANNEL AUDIO SWITCHING INPUTS AND OUTPUTS:

LEFT AUDIO INPUTS: J4 PINS 15 AND 18
RIGHT AUDIO INPUTS: J4 PINS 19 AND 22
LEFT AUDIO OUTPUTS: J4 PINS 16 AND 17
RIGHT AUDIO OUTPUTS: J4 PINS 20 AND 21

SWITCHING NETWORK IS USED FOR PROGRAM AUDIO LOOP THROUGH FOR AUTOMATIC STATION INSTALLATIONS. NORMALLY LEFT INPUTS ARE CONNECTED TO LEFT OUTPUTS AND RIGHT INPUTS ARE CONNECTED TO RIGHT OUTPUTS. ISOLATION: GREATER THAN 30 dB. INSERTION LOSS: LESS THAN 0.2 dB.

DURING ALARM MODE LEFT AND RIGHT AUDIO OUTPUTS CARRY BALANCED 600 OHM PROGRAM AUDIO. LEVELS ARE ADJUSTABLE FROM -20 dBM TO +8 dBM.
DISTORTION 2% MAX.

DECODER PERFORMANCE

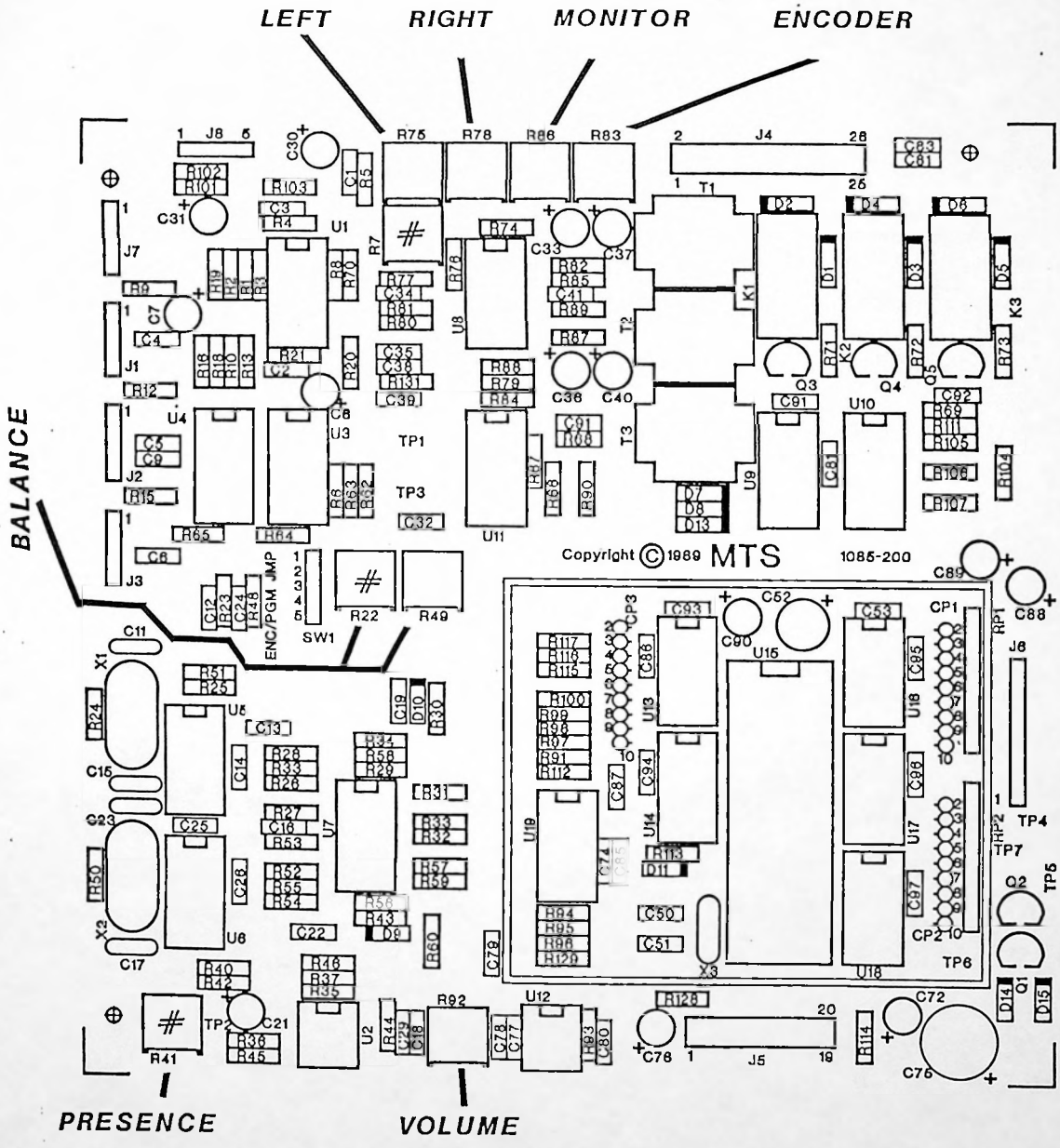
FOR SUCCESSFUL EBS TONE DECODING THE FOLLOWING REQUIREMENTS SHALL BE MET:

(1) TONE DURATION: THE TONES SHALL REMAIN CONSTANT FOR A PERIOD OF 8.50 SECONDS.

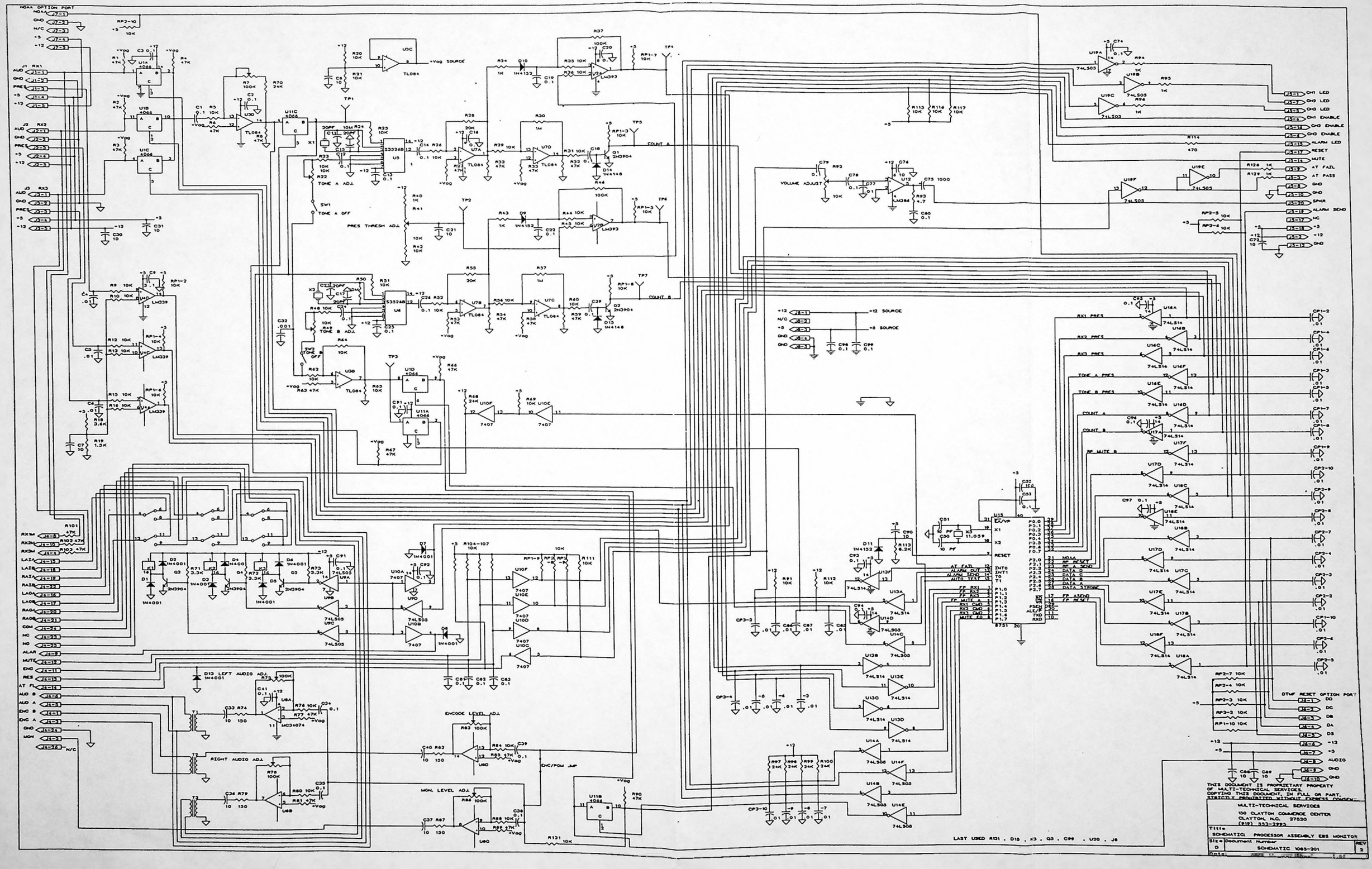
(2) INPUT LEVEL: EACH TONE SHALL HAVE A LEVEL OF AT LEAST 20 mV RMS AT THE RX AUDIO INPUT PORT USED. FURTHER, THESE TONES SHALL BE BALANCED WITHIN 2dB.

(3) TONE ACCURACY: THE DECODER WILL RESPOND TO TONES THAT ARE 853 +/- 4.5 Hz AND 960 +/- 4.5 Hz AND WILL NOT RESPOND TO TONES THAT ARE GREATER 5.0 Hz FROM THE ASSIGNED CENTER FREQUENCY. NO KNOWN COMBINATIONS OF NOISE NOR OUT OF BAND SIGNALS WILL CAUSE A SUCCESSFUL DECODE.

ADJUSTMENT LOCATIONS



#DO NOT ADJUST


NOAA OPTION PORT
ENCODE LEVEL ADJ.
MON. LEVEL ADJ.
RIGHT AUDIO ADJ.
D13 LEFT AUDIO ADJ.
TONE A ADJ.
TONE B ADJ.
PRES THRESH ADJ.
VOLUME ADJUST
TONE A OFF
TONE B OFF
ENC/POW JMP
COUNT A
COUNT B
+Vpp SOURCE
+12 SOURCE
+8 SOURCE
CH1 LED
CH2 LED
CH3 LED
CH1 ENABLE
CH2 ENABLE
CH3 ENABLE
ALARM LED
RESET
MUTE
AT FAIL
AT PASS
EPROM
ALARM SEND
DTMF RESET OPTION PORT
LAST USED R131 , D18 , K3 , Q3 , C99 , U20 , J8
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MULTI-TECHNICAL SERVICES
100 CLAYTON COMMERCE CENTER
CLAYTON, N.C. 27520
(919) 553-2893
Title SCHEMATIC PROCESSOR ASSEMBLY EBS MONITOR
Size D
Document Number SCHEMATIC 1083-201
REV 2
Date:

SECTION TWELVE: SPARE MODULES AND FACTORY SERVICE

MODULE SPARES KITS ARE AVAILABLE FOR THE SYSTEM 1000 AS FOLLOWS:

KIT, SPARE FM B.C. RECEIVER MODULE	P/N 2017-952
KIT, SPARE AUDIO PROCESSOR MODULE	P/N 2017-954
KIT, SPARE AM B.C. RECEIVER MODULE	P/N 2017-955
KIT, SPARE POWER SUPPLY MODULE	P/N 2017-956
KIT, ACCESSORY	P/N 2017-957
KIT, SPARE WALL TRANSFORMER	P/N 2017-959

WHEN ORDERING RECEIVER KITS, SPECIFY OPERATING FREQUENCY

FOR FACTORY SERVICE OF MODULES AND OR UNITS, PLEASE CALL MTS SERVICE DEPARTMENT AND OBTAIN A MATERIAL RETURN NUMBER. MAKE SURE THAT THE MATERIAL RETURN NUMBER IS READILY VISIBLE ON THE OUTSIDE OF YOUR SHIPPING CARTON. ALL MATERIAL RETURNS MUST BE SHIPPED TO MTS FREIGHT PRE-PAID. FREIGHT COLLECT ITEMS WILL BE REFUSED.

TO ORDER MODULE SPARES, ANTENNAS, OR KITS, PLEASE CALL MTS SALES DEPARTMENT, OR YOUR FAVORITE DISTRIBUTOR OF FINE BROADCAST EQUIPMENT FOR CURRENT PRICING.

MTS COMMUNICATIONS PRODUCTS DIV.