

INSTALLATION MANUAL

CSD-10

MODEL

1200006-101

**CSD-10-101 SELCAL
INSTALLATION AND
OPERATION MANUAL**

Avtech Part Numbers 1200006-101

**MANUAL PART NUMBER
0200008-101**

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CHANGE RECORD

REV	PAGE	DESCRIPTION
1	All	Cloned from Coltech document 0200008-101 Rev -. All textual references to Coltech and formatting has been changed to Avtech where possible. This component maintenance manual may contain references to Coltech drawings and document numbers. REF DCR D010480

SERVICE BULLETIN RECORD

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DESCRIPTION

The CSD-10-101 SELCAL DECODER is a remote mounted, two channel, 16 tone decoder for the ICAO and ARINC standard SELCAL system, as defined in RTCA paper DO-93. It has transformer isolated inputs for two radio sources to drive its two decoder channels and operates over the extended temperature range of -55 degrees C to +55 degrees C. It is connected to communication radio receivers (typically the VHF and HF receivers) and monitors their audio outputs for the SELCAL tone codes. Upon receiving the code for which it is programmed it will cause aircraft annunciator lights to flash and a audio signal to be generated and sent to the aircraft audio system to alert the crew that a call has been received.

Certified to TSO C59 and designed to meet or exceed the performance requirements of ARINC Characteristics 596 and 714, the CSD-10 uses proven aircraft techniques and materials and is digitally based and crystal controlled using a microprocessor, digital filters and signal processing, and digital frequency generation for its decoding functions. The entire unit is housed in an anodized aluminum case with the front bezel made of machined aluminum and anodized for protection and appearance. The materials used within the unit are of the high quality associated with air transport equipment and consideration has been given to the safety and reliability requirements of air transport operations.

By connecting pins in the rear connector of the unit, the individual code assigned to the aircraft is programmed for the unit to recognize. Outputs are provided to connect to aircraft systems for annunciation of calls.

A Self-Test function is activated by pressing the external Test/Reset button and will cause the lights to flash and the audio annunciator to sound in verification that the internal circuits are functioning properly.

OPERATION

Pilot operation of the CSD-10 is limited to resetting it after a call and performing a self test.

Resetting the unit after a call is accomplished by pressing the external reset switch, mounted in the cockpit within reach of the crew.

Generating a SELF TEST is also done by pressing the external reset switch. As long it is held depressed annunciator lamps will be lighted and the aural signal will be generated.

If a selective call sequence is detected, the annunciator lamp for the associated receiver will flash and the audio signal will consist of a one second on, one second off sequence, continuing for two rings and sounding much like a conventional telephone ringing. The annunciation mode may be canceled at any time by pressing the reset button. The ring sequence will be repeated every 30

seconds and the lamp will constantly flash until the unit is reset. If an external chime is connected it will be rung at 30 second intervals also.

SPECIFICATIONS

Part Number:	1200006-101
Certified to TSO:	C59
Conforms to RTCA Spec:	DO-93 as amended.
Software Certification:	Software has been tested and documented per the requirements of RTCA paper DO-178A for Level 3 software.
ARINC Characteristics:	Complies with the performance requirements of ARINC characteristics 596 and 714.
Number of Channels:	Two
Number of Radios Monitored:	Two
Size:	5.75" wide, 1.87" high, 4.80" behind mounting surface
Mounting:	4 ea, 8-32 machine screws or equivalent
Weight:	1 pound 7 ounces
Operating Temperature:	-55 degrees centigrade to +55 degrees centigrade continuous, +71 degrees centigrade for up to 30 minutes
DO-160B Vibration:	Categories PKS for non-vibration isolated mounting in Helicopters and Fixed Wing turbojet and propeller driven aircraft.
Operating Altitude:	Up to 55,000 feet, non-pressurized.
Input Voltage:	20 to 35 VDC, 27.5 VDC nominal. Voltage below 18 VDC will inhibit operation of annunciators and decoding.
Input Current:	60 ma nominal, 200 ma maximum

Mating Connector:	MS34761 18-32S per MIL-C-26482, series II or equivalent
Tone Inputs:	Each input is nominally 10,000 ohms input impedance.
Input Tone Level:	0.1 VRMS to 3.2 VRMS
Tone Frequency Tolerance:	Normal operation with tones less than 0.3% off frequency.
Tone Rejection:	Greater than 36 db rejection to tones more than +/- 3.5 percent off frequency.
Tone Amplitude Difference: (Twist)	Must be less than 10db.
Tone Duration:	750 milliseconds minimum, 1.25 seconds maximum
Tone to Noise Ratio:	-6 db minimum.
Tones Decoded:	16 ARINC standard SELCAL tones, labeled A, B, C, D, E, F, G, H, J, K, L, M, P, Q, R, S.
Code Selection Method:	Jumper wires in the installation harness or ARINC compatible SELCAL selector panel.
Annunciator Lamp Interfaces:	Flashing and Steady outputs pulled to ground per ARINC 596 and 714 for chime and external annunciators. Maximum off voltage, 80 VDC. Maximum on current, 0.5 amps.
External Reset:	External switch, normally open. Closure to ground will reset annunciations or cause self-test as appropriate.
Audio Annunciator Drive Output:	1.75v rms nominal into 150 ohms
Audio Annunciator Signal:	Alternating 2000 Hz and 1600 Hz tone, combined to give a warble sound. Switched on and off at 1 Hz rate to simulate telephone like ringing for two rings. If not reset within 30 seconds, repeats ring sequence.
Self Test:	Pressing external reset button when annunciator lamps are not illuminated verifies that the computer, lamps drivers, and audio annunciator drive are functional.

INSTALLATION

The CSD-10 is intended for mounting in the remote radio rack of an aircraft or helicopter. It is to be hard mounted using 8-32 screws or equivalent.

At installation it is necessary to connect various pins in the units connector to program the sequence necessary for a valid decode. Programming the CSD-10 to respond to a selective call is done by connecting the code selection pins to the CODE SELECT COMMON pin according to Figure 3. The SELCAL code is composed of four letters. For instance a code might be FJ-LQ. The order of the letters within a group of two is not critical, however it is customary to place them in alphabetical order. The code pins are labeled according to the tone they control. Those pins labeled LETTER 1-X set the first code letter, F in the example. LETTER 2-X sets the second code letter. LETTER 3-X and LETTER 4-X set the second code letter pair. Figure 3 has an example.

The installation wiring drawing (Figure 1) shows connection pins for airline VHF communication transceivers which meet either ARINC characteristic 716 or 566. Other transceivers may be used, such as HF units, if the equivalent pins are utilized.

Audio for the CSD-10 input should be obtained from the SELCAL output of normal VHF and HF receivers. The audio level at the SELCAL output is normally within the range of the input levels accommodated by the CSD-10 and may be connected directly.

The assignment of codes for SELCAL operation is coordinated by SELCAL Registrar, Aeronautical Radio, Inc., 2551 Riva Road, Annapolis, Maryland, 21401. Phone number is (410) 266-4142.

Contact them if a code has not been assigned to the aircraft. They will require the following information:

- Name of Applicant Company
- Person to Contact
- Aircraft Registration Number
- Company Address
- Intended world areas of operation
- If your decoder is a 12 or 16 tone decoder.
(The CSD-10 is a 16 tone decoder)

There is no charge for a code assignment at this time. This code is assigned to the USER and does NOT transfer with the aircraft when it is sold.

INSTALLATION WIRING CONSIDERATIONS

TEST/RESET INPUT

The TEST/RESET INPUT line (Pin P) connects directly to the RESET/TEST circuits of the CSD-10. A normally open switch connected to this pin will reset the CSD-10 or cause a self test.

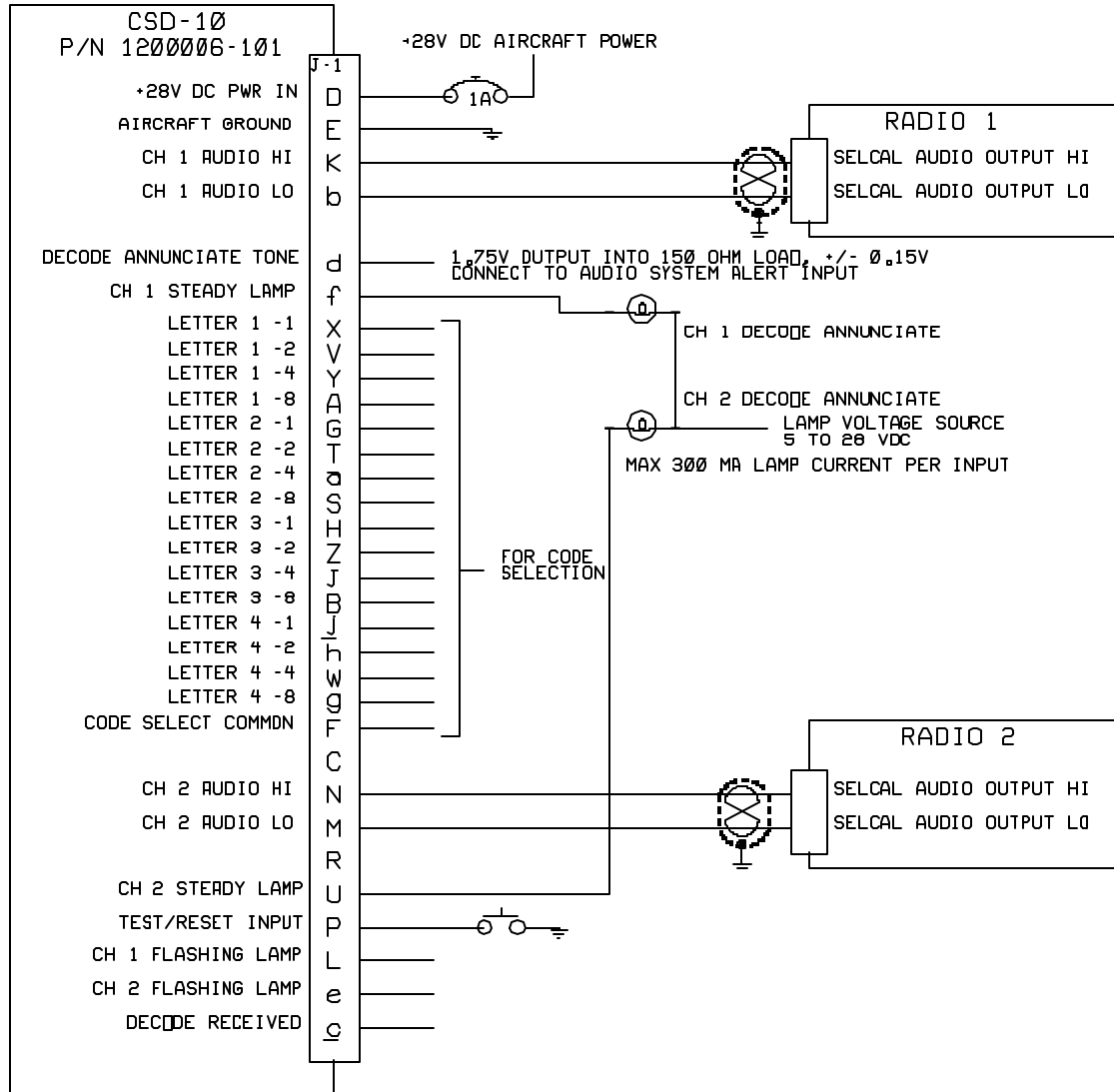
STEADY LAMP AND FLASHING LAMP LINES

The CH 1 STEADY LAMP, CH 2 STEADY LAMP, CH1 FLASHING LAMP, CH 2 FLASHING LAMP and DECODE RECEIVED outputs are intended to drive an external chime or annunciator lamps mounted elsewhere in the cockpit. They are all open collector transistors which can withstand 80 volts when off and connect to power ground when on. They will carry 0.5 amps maximum when on. When on and sinking 0.5 amps, the voltage at the pin may be as high as 1 volt. The LAMP lines will activate when the corresponding decode channel detects a selcal code for which the unit is programmed from the radio associated with that channel. The DECODE RECEIVED line will turn on as soon as a valid selcal signal is detected and will stay on until reset. If the CSD-10 is not reset within 30 seconds, the DECODE RECEIVED line will turn off for one second and then turn back on. This is intended to cause an external chime to sound every 30 seconds until the unit is reset.

AUDIO SOURCE SELECTION

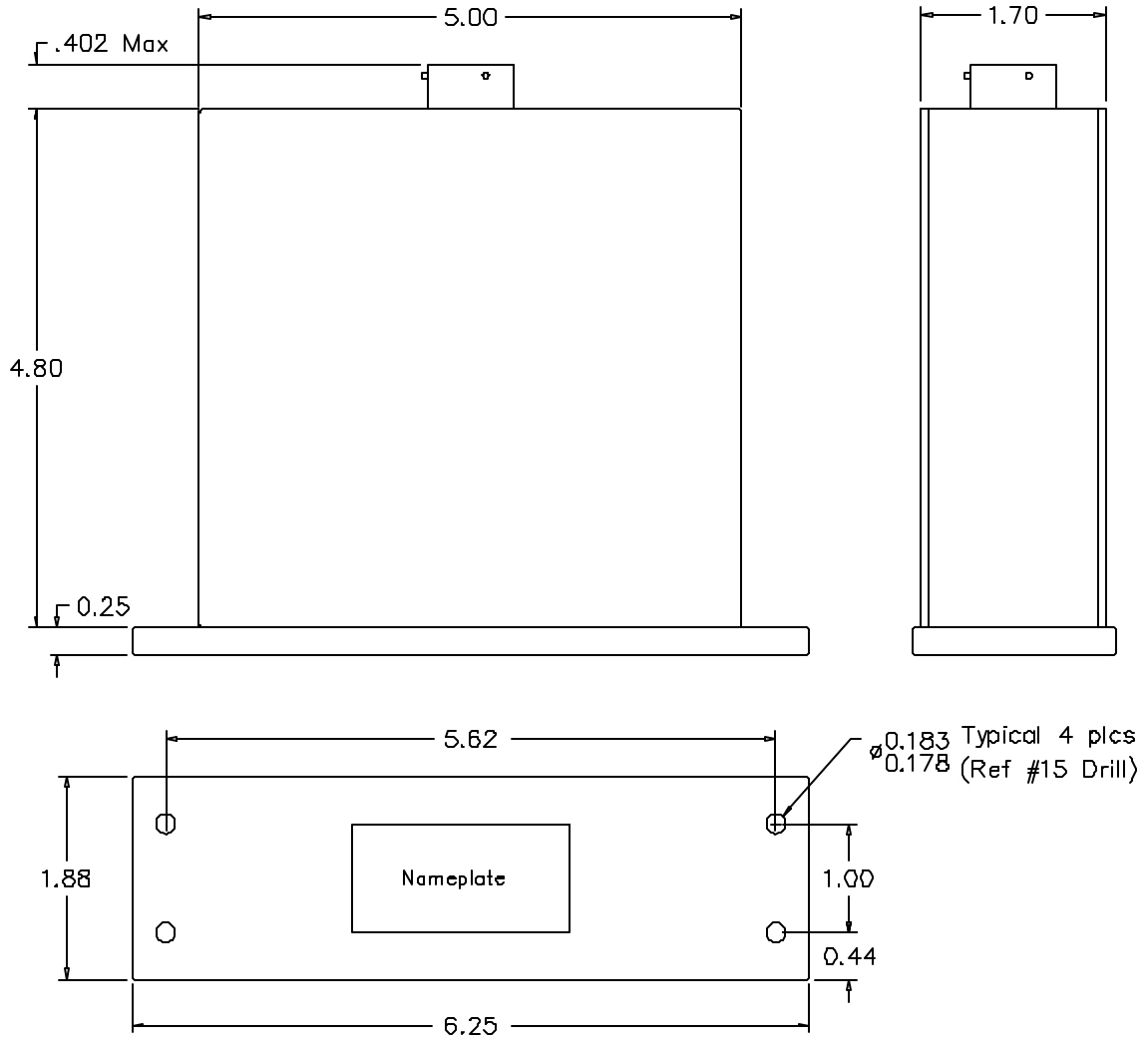
The CSD-10 MUST be connected to the SELCAL output of HF receivers if at all possible, since the Clarifier function on the HF effects the frequency of the normal audio output and will cause the SELCAL signals to be off frequency. If the HF does not have a SELCAL output, it must be operated in AM mode whenever a SELCAL signal is expected. It will not receive the call otherwise.

For receivers without transformer outputs with HI and LO signal lines, return the CSD-10 INPUT LO lines for the appropriate channel to a ground which is physically and electrically close to the source radio to avoid ground noise pickup. Do not use volume controlled audio as input to the CSD-10. Use twisted, shielded wire to connect the audio to avoid hum and noise pickup. Any quality communications receiver may be used to receive the SELCAL signals for CSD-10 use. Commonly, VHF and HF are the most used. Connections to receivers not shown should follow the example to the extent possible.



NOTE :
 INPUTS ON PINS c, e, f, L and U ARE NORMALLY OPEN, AND CONNECT TO GROUND
 WHEN ACTIVE. MAX INPUT CURRENT IS 300 MA, MAX OFF VOLTAGE IS 40V DC.

Figure 1 Installation Wiring Diagram



NOTES Unit Part Number: 1200006-101
 Weight: 21 oz, ± 3 oz
 Interconnect Dwg: 0800012-101
 Mating Connector: MIL-C26482 MS3476L 18-32S

Figure 2 Outline Drawing

CODE LETTER	J1 PIN
FIRST	A Y V X
SECOND	S a T G
THIRD	B J Z H
FOURTH	g W h j

LETTER	PIN CODING
A	0 0 0 1
B	0 0 1 0
C	0 0 1 1
D	0 1 0 0
E	0 1 0 1
F	0 1 1 0
G	0 1 1 1
H	1 0 0 0
J	1 0 0 1
K	1 0 1 0
L	1 0 1 1
M	1 1 0 0
P	1 1 0 1
Q	1 1 1 0
R	1 1 1 1
S	0 0 0 0

0 represents a connection to the CODE SEL COMMON, Pin F.

1 represents no connection to the CODE SEL COMMON, Pin F.

Example:

Code FJ-LQ is programmed by jumpering the following pins to pin F:

A & X	(Letter F)
a & T	(Letter J)
J	(Letter L)
j	(Letter Q)

Figure 3 - Code Programming

The following tests should be performed to verify the installation in the airplane is operating properly:

1. Apply power to the unit and press the Reset/Test button to initiate a SELF TEST. All annunciator lights should light and the audio ringing should be heard in the aircraft audio system. Be sure the aircraft dimmer circuit is turned on bright if used.
2. Select an unused frequency for test on one of the communication transceivers to which the CSD-10 is connected. Using a ground test set, on the test frequency generate a SELCAL encoded signal of the sequence programmed into the CSD-10.
3. Confirm that the appropriate annunciator lamp flashes and the audio is heard.
4. Wait 30 seconds until the ring sequence repeats and check for proper ringing repeat. Press the Reset/Test button to reset the unit.
5. If possible, contact the agency which will be furnishing SELCAL service to the aircraft and request a test call. Do this test for both SELCAL channels.

EQUIPMENT AND ACCESSORY PART NUMBERS

Avtech

Part Number Description

1000005-001 Ramp Test Set System, SELCAL/ATSCALL, 115v/60Hz

1000005-002 Ramp Test Set System, SELCAL/ATSCALL, 220v/50Hz

2000001-004 Connector, Crimp W/Contacts MS3476L 18-32S

2000001-006 Contact, Socket, Crimp M39029/5-115

2000001-007 Connector, Backshell Type C MS3416-18-EN